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STATE OF SINGAPORE

REPORT OF THE MINISTRY OF HEALTH

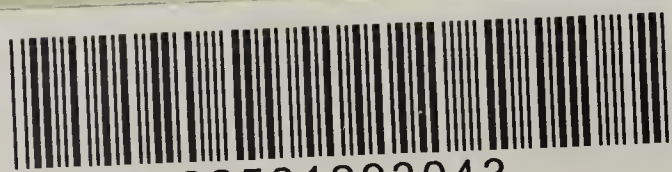
for the year ended 31st December, 1961

BEING THE ANNUAL REPORT ON THE MEDICAL DEPARTMENT
BY THE ACTING DIRECTOR OF MEDICAL SERVICES
FOR THE YEAR
1961



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STATE OF SINGAPORE

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MINISTRY OF HEALTH
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INTRODUCTION

TO THE HONOURABLE MR. YONG NYUK LIN
MINISTER FOR HEALTH, SINGAPORE.

Sir,

I have the honour to present the Annual Report for the year ended 31st December, 1961.

During the year the Ministry was mainly concerned with its own re-organisation, planning for new services in the 4-Year Development Plan and with the maintenance of existing services.

With the integration of the City Health Department, Rural Board Health Sections, etc. the re-organisation of the Ministry of Health continued in 1961 and was a subject of a detailed study by the Organisation and Methods Branch of the Ministry of Finance. The report was published in September and the recommendations were acceptable for implementation on 1st January, 1962.

The future organisation chart of the Ministry of Health will be in four Divisions as follows:

Headquarters which administers the Department of Dentistry, the Pathology and the T.B. Control Unit and the Principal Matron's office.

Hospitals Division is under a Deputy Director of Medical Services (Hospitals), administers all the Government Hospitals including Middleton Hospital and all the Out-Patient Clinics.

Health Division is under a Deputy Director of Medical Services (Health), administers all health functions of the integrated City Council, the Rural Board, the City Cleansing, the Markets and Hawkers Department and the Maternity and Child Health Services.

Chemistry Division includes the Government Chemistry Department and the City Council Analyst's Laboratory.

Three events occurred in the year which are of importance to this Ministry. One was the strike of the daily-rated staff of the Government and City Council Health Departments; the others were the Anti-Cholera Inoculation Campaign and the emergency measures taken for the victims of Bukit Ho Swee fire.

From the 31st October to the 24th November, 1961, the daily-rated staff of the Government and City Council Health Departments went on strike involving the Cleansing and Anti-Mosquito Services particularly. Despite the strike measures which were taken to maintain these essential services were carried out smoothly and with little disruption to the normal services.

An island-wide Cholera Inoculation Campaign was conducted during the latter half of the year as a precaution against the threat of introduction of the disease from the surrounding countries which were infected. A total of 474,224 persons were inoculated in this campaign.

The Bukit Ho Swee fire which occurred in May brought a rapid response for emergency health services. A few hours after the outbreak of the fire, an emergency first aid station was established at the relief centres and infant welfare was also established and all other necessary health precautions were taken.

Despite the increasing demands from the public in the hospitals and the out-patient services, the maintenance of the services was efficiently carried

out and in spite of the many difficulties encountered the health of the State continued to maintain improvement.

The infantile mortality rate per thousand live births is 32.3 which is the lowest on record. There is also a decrease in the number of deaths and the death rate per thousand population is 5.9.

There was no outbreak of infectious diseases and Singapore remained free again from indigenous malaria. Diphtheria is still the cause of concern and it will become compulsory to immunise all children in the year when the Bill of compulsory immunisation is adopted.

The vital statistics showed a continued improvement. The estimated mid-year population is 1,687,300; the birth rate per thousand population is 35.5 (compared with 37.8 in 1960); the crude death rate per thousand population is 5.9 (compared with 6.2 in 1960); the infantile mortality rate per thousand live births is 32.3 (compared with 34.9 in 1960); and the maternal mortality rate was the same as last year at 0.4.

THE MEDICAL REGISTER, 1961

	Doctors	Dentists	Female Nurses	Male Nurses	Asst. Nurses	Mid-wives	Pharmacists
Government Medical Dept.	251	44	727	267	318	524	24
City Council	18	..	101	21	13	134	1
University of Singapore (Teaching Staff)	40	11	..	..	..	..	4
Private practice and Private Institutions	359	267	361	13	61	367	70
Housemen	39	..	..	..	..	..	..
Total ..	707	322	1,189	301	392	1,025	99

The ratio of doctors to population is 1 to 2538.

Medical Staff

The 1961 Estimates contained provision for 49 specialist medical posts, 32 posts of senior registrar, 254 of medical officers and 50 posts of houseman. As at 31st December, 1961, only 27 specialist medical posts and 18 senior registrar posts were substantively filled, whilst there were 201 medical officers and 49 housemen.

Two senior medical personnel left the service — a pædiatrics specialist who retired from the service under the Malayanisation Scheme and a radiologist (therapy) whose contract expired.

To ease the present shortage of specialist staff, one pathologist, two bacteriologists and one Senior Registrar in Pædiatrics were recruited from Israel. Five senior registrars were recruited from Japan on contract.

At the beginning of 1960, seventeen medical officers and one dental officer were undergoing post-graduate training overseas and during the course of the year, four medical officers proceeded overseas on study awards. Five medical officers and one dental officer returned after having successfully completed their courses of study. Study courses were awarded to sixteen medical officers. Two doctors successfully completed the D.P.H. course at the University of Malaya and another two doctors were awarded Departmental Fellowships. The University of Malaya graduated 81 doctors, 18 dentists and 5 pharmacists.

Under the Colombo Plan, the Royal Australasian College of Surgeons again conducted the Primary Examination for their Fellowship in Singapore

in February 1961. Australian lecturers conducted a preparatory study course for 37 doctors for the Primary Examination. Of a total of 41 who sat for the Primary Examination, 7 were successful of whom 2 were Government sponsored candidates.

Training of Nursing and Ancillary Personnel

There were approximately 430 students in training at General Hospital. A total of 128 nurses passed their Final Examination. During 1961, 185 student nurses (151 females and 34 males) were recruited. 33 nurses were transferred from the affiliated hospitals (4 from St. Andrew's Mission Hospital and 29 from Mandalay Road Hospital).

The number of pupil assistant nurses in training were approximately 230 and they were trained at Tan Tock Seng Hospital and Thomson Road Hospital. During the year 149 were recruited and 78 passed their Final Examination.

Midwives were trained at Kandang Kerbau Hospital. Pupil midwives on completion of training are still given three months' experience in rural domiciliary midwifery. 95 pupils were accepted for training and 33 passed the examination set by the Midwives Board. 56 trained nurses commenced their midwifery training and 64 passed the Midwives Board Examination.

Psychiatric nurses were trained at Woodbridge Hospital. There was no intake of basic students in 1961. Nine post-basic students (4 males and 5 females) commenced their training in October. There were 78 students, 20 post-basic and 58 basic students. Four basic students and 12 post-basic students passed their Final Examination.

12 Public Health nurses passed the Royal Society of Health Examination in 1961.

Tuberculosis training was carried on in Mandalay Road Hospital. 22 students were taken in. Average number of nurses in training was 53, and 29 basic students passed their Final Tuberculosis Examination.

The first post-basic Pædiatric Nursing Course which commenced in 1959 was completed in August 1961. The eight candidates sat their final examinations conducted by the Singapore Nursing Board and were all successful.

Finance

During the year \$49.7 million was spent on medical and health services in Singapore which represents \$29.46 *per capita*.

Detailed information regarding the work of individual divisions, departments, sections, etc. are in different sections of this report.

I have the honour to be,
Sir,
your obedient servant,
NG SEE YOOK,
L.M.S. (Singapore), D.P.H. (London),
Acting Director of Medical Services,
Singapore.

13th November, 1963.



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PART I
GENERAL



Chapter One

LEGISLATION

TWO ORDINANCES were passed during the year and another was placed before the Assembly in the form of a Bill. It is expected that this legislation will be approved early in the new year.

Tan Tock Seng's Hospital (Transfer) Ordinance, 1961 (No. 3 of 1961).

Under an existing arrangement with the Tan Tock Seng Hospital's Committee of Management, before the coming into force of the Tan Tock Seng's Hospital (Transfer) Ordinance, 1961 Government provides all staff except 600 persons equivalent to Division IV in Government Service. The Committee of Management's responsibilities, therefore, are confined to the scrutiny of estimate proposals, dealings with tenders for hospital supplies and the 600 staff mentioned above.

In pursuance of Government's policy to integrate the City Council and other statutory organisations into Government in order to achieve a unified administration of all City and Rural health services under one authority, it was decided that the Tan Tock Seng Hospital which exists as a statutory corporation should be transferred to Government. The Ordinance, therefore, provides for the transference of the hospital to Government.

Diphtheria Immunisation Ordinance 1961 (No. 6 of 1961)

The importance of child health by positive measures for compulsory immunisation against diphtheria and tuberculosis is one of the main points in the Government's public health programme. Compulsory immunisation against diphtheria exists in countries like Japan, Canada, Germany, France, U.S.S.R. and Yugoslavia and has been responsible, by obtaining maximum coverage of the child population, for the eradication or effective reduction of the disease.

In Singapore some 600 cases of the disease occur annually with over 50-60 deaths. All these are preventable.

The growing importance of diphtheria as a public health problem was realised as far back as the 1930's when the then Municipal Commissioners pressed for action to introduce preventive measures.

Preventive inoculation against diphtheria was started on a voluntary basis in the City area in 1938 and in the rural areas after World War II.

For the effective eradication or reduction of the disease at least 90 per cent of the children should be covered by immunisation. In order to ensure this, it is necessary to require compulsory immunisation of all infants and children. The Ordinance, therefore, provides for the compulsory inoculation against diphtheria for every child residing in Singapore within 12 months of birth or, alternatively, for every child so resident who is under the age of 7 years and who has not been previously immunised against diphtheria.

Penalties are also prescribed in the Ordinance for non-compliance with the provisions of the Ordinance.

Diphtheria Immunisation (Amendment) Bill

This Bill provides for four changes to the main Ordinance. Firstly, provision is made to extend the Ordinance to enable medical officers and nurses serving in H.M. Forces in Singapore to carry out intradermal tests and

innoculation required under the Ordinance. This is necessary to cover the substantial Services population who normally receive complete medical care from their own medical service units.

Secondly, provision for exemption from inoculation is made under certain circumstances. The Ordinance as it stands only allows postponement for three months at a time. This is inadequate in the case of certain debilitating conditions like unabsented heart disease, chronic nephritis, serious allergies, etc.

Thirdly, the definition of "medical certificates" has to be extended to include such other certificates as may be accepted by the Deputy Director of Medical Services (Health) (mainly from outside the country) as evidence of inoculation; the principal Ordinance is too restricted and only covers certificates issued by registered medical practitioners in Singapore.

Fourthly, opportunity is taken to effect a consequential amendment arising from the reorganisation of the Ministry of Health and reference to Assistant Director of Medical Services (Health) in the principal Ordinance is changed to Deputy Director of Medical Services.

SUBSIDIARY LEGISLATION

Cremation (Mount Vernon) By-laws, 1961

These by-laws, made under section 319 of the Local Government Ordinance, 1957, were introduced for the new crematoria at Mount Vernon.

Food and Drugs (Amendment) Regulations, 1961

These regulations, made under section 28 of the Sale of Food and Drugs Ordinance (Chapter 148), cover the following main subjects:

- (i) false advertisements;
- (ii) addition of vitamins to condensed and dried milks to be permitted in prescribed amounts;
- (iii) regulations on antioxidants based on U.K. Regulations;
- (iv) dried half cream milk to be allowed also — dried skimmed milk — if vitaminised to prescribed levels of Vitamins A and D.

Chapter Two

STAFF WELFARE

THE Labour and Welfare Section of the Government Health Department continued to provide a welfare service for the daily-rated force throughout the year 1961. The distribution of the labour force to the three District Councils, the City Cleansing Department, the City Anti-Malarial Department with the retention of a small nucleus for the work of the Central Health Office was done satisfactorily taking into account the personal problems involved in such transfers. A healthy relationship between the official side and the labour force has been maintained. During October/November, 1961, there was a General Strike of daily-rated employees which ended with an Agreement signed on 25th November, 1961. The financial position of the Government Health Department Labourers' Co-operative Credit Society Ltd. is given in Table 1.

TABLE 1

FINANCIAL SUMMARY OF GOVERNMENT HEALTH DEPARTMENT LABOURERS' CO-OPERATIVE CREDIT SOCIETY LTD.

		<i>Year ended 31st December, 1960</i>		<i>Year ended 31st December, 1961</i>	
		\$	c.	\$	c.
Post Office Savings Bank	...	5,041	97	5,041	97
Chartered Bank	...	1,042	35	659	39
Cash in transit	..	1,657	40	1,980	30
Investments	...	48,530	75	48,530	75
Loans outstanding	...	8,155	50	8,245	00
		<hr/> 64,427 97 <hr/>		<hr/> 64,457 41 <hr/>	
Membership	...	200		234	
Total staff eligible	...	1,369		1,373	

The Annual Sports of the Singapore Medical Services was held in July 1961. General Hospital won the Challenge Shield.

Concerts, social activities and children's parties were held in various institutions during the year.

Chapter Three

VITAL STATISTICS

The population estimates of Singapore by Race group and sex are given in the Tables 2 and 3.

TABLE 2
POPULATION OF SINGAPORE, 1911—1961

Year	Total	Malays	Chinese	Indians and Pakis- tanis	Eura- sians	Euro- peans	Others
1911 (Census) ..	303,321	41,806	219,577	27,755	4,671	5,711	3,801
1921 (Census) ..	418,358	53,595	315,151	32,314	5,436	6,145	5,717
1931 (Census) ..	557,745	65,014	418,640	50,811	6,903	8,082	8,295
1947 (Census) ..	938,144	113,803	729,473	68,967	9,110	9,279	7,512
1957 (Census) ..	1,445,929	197,059	1,090,596	124,084	11,382	10,826	11,982
1958 (Mid-Year)	1,514,000	207,300	1,141,800	129,500	11,700	11,400	12,300
1959 (Mid-Year)	1,579,600	217,400	1,190,000	134,600	12,200	12,200	13,400
1960 (Mid-Year)	1,634,100	227,300	1,230,700	137,800	12,200	12,700	13,400
1961 (Mid-Year)	1,687,300	236,400	1,269,100	141,500	12,800	13,400	14,100

The racial group 'Malays' includes 'Indonesians'.

TABLE 3
MID-YEAR POPULATION ESTIMATES OF SINGAPORE BY RACIAL GROUP
AND SEX, 1961

Malays	...	...	122,900	113,500	236,400
Chinese	...	...	643,300	625,800	1,269,100
Indians and Pakistanis	...	...	93,800	47,700	141,500
Eurasians	...	...	6,400	6,400	12,800
Europeans	...	...	7,200	6,200	13,400
Others	...	...	7,600	6,500	14,100
Total			881,200	806,100	1,687,300

The racial group 'Malays' includes 'Indonesians'.

The ratio of females to males is as follows:

1931	584 to 1,000
1947	819 to 1,000
1957	940 to 1,000
1961	914 to 1,000

The number of births in 1961 was 59,930 compared to 61,775 in 1960 showing a *decrease* of 1,845.

The crude birth rate per 1,000 in 1961 was 35.5 per thousand compared with 37.8 in 1960.

TABLE 4

LIVE-BIRTHS WHICH OCCURRED IN 1961
BY RACIAL GROUP AND AGE OF MOTHER AND BY SEX OF CHILD

Mother's Age in Years		TOTAL			MALAYS		CHINESE		INDIANS AND PAKISTANIS		EURA- SIANS		EURO- PEANS		OTHERS	
		M. and F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
12	..	1	..	1	..	1	..	..	..	..	..	..	..	..	..	..
13	..	4	2	2	..	1	..	..	2	1	..	..	..	..	..	..
14	..	31	13	18	5	11	1	2	7	5	..	..	..	..	..	..
15	..	104	51	53	23	23	11	10	16	20	1	..	..	..	..	..
16	..	270	145	125	77	59	40	32	27	32	..	1	..	..	1	1
17	..	683	355	328	141	147	173	126	39	52	..	1	..	..	2	2
18	..	1,180*	602	577	227	207	294	285	73	80	1	..	1	..	6	5
19	..	1,554	846	708	233	195	516	401	87	107	5	..	..	..	5	5
20	..	2,769	1,421	1,348	397	384	876	823	139	129	3	4	1	1	5	7
21	..	3,699	1,899	1,800	458	398	1,256	1,206	153	173	11	13	7	1	14	9
22	..	3,688	1,890	1,798	408	395	1,311	1,205	149	160	11	11	5	10	6	17
23	..	3,292	1,717	1,575	399	326	1,154	1,090	141	130	9	12	4	7	10	10
24	..	3,336	1,720	1,616	350	297	1,197	1,138	141	155	14	12	6	5	12	9
25	..	4,189	2,159	2,030	401	414	1,568	1,426	152	151	11	15	13	8	14	16
26	..	3,877	1,987	1,890	348	329	1,480	1,413	127	114	18	11	7	12	7	11
27	..	3,405	1,783	1,622	306	269	1,328	1,213	123	109	8	11	9	6	9	14
28	..	3,387	1,712	1,675	313	310	1,266	1,228	99	108	13	8	9	10	12	11
29	..	2,854	1,432	1,422	212	192	1,110	1,110	83	90	11	11	8	13	8	6
30	..	3,290	1,669	1,621	328	307	1,185	1,151	114	133	11	6	12	14	19	10
31	..	2,637	1,335	1,302	176	182	1,051	1,016	78	74	12	10	11	6	7	14
32	..	2,583	1,340	1,243	210	192	1,026	953	78	82	7	7	6	3	13	6
33	..	2,064	1,025	1,039	131	171	812	800	64	54	7	2	7	11	4	1
34	..	1,847	955	892	111	132	788	694	36	39	5	11	10	9	5	7
35	..	1,681	879	802	170	137	630	600	60	51	5	4	4	5	10	5
36	..	1,429	704	725	87	93	577	586	27	32	7	3	2	3	4	8
37	..	1,244	613	631	72	85	517	511	16	27	3	3	..	4	5	1
38	..	1,246	668	578	102	84	522	457	30	30	4	2	5	2	5	3
39	..	884	470	414	43	44	403	343	17	22	4	3	3	1	..	1
40	..	814	429	385	61	34	352	337	13	10	1	1	1	..	1	3
41	..	625	328	297	22	21	298	266	7	7	..	2	1	1	..	..
42	..	434	223	211	18	17	199	186	3	6	2	1	..	..	1	1
43	..	323	173	150	18	12	151	130	4	6	..	1	..	..	..	1
44	..	195	98	97	5	5	92	91	..	1	1	..	..	..	..	..
45	..	136	58	78	6	11	52	67	..	..	..	..	..	..	..	..
Over 45	..	165	85	80	10	13	71	67	4	..	..	..	..	..	..	..
Unknown	..	10	5	5	..	..	2	2	..	..	..	..	..	..	3	3
Total		59,930*	30,791	29,138	5,868	5,498	22,309	20,965	2,109	2,190	185	166	132	132	188	187

* Includes 1 Unknown sex (Chinese).
Figures exclude live-births of wives of non-locally domiciled Services personnel.
The racial group 'Malays' includes 'Indonesians'

TABLE 5
LIVE-BIRTHS WHICH OCCURRED IN 1961
BY REGISTRATION AREA, RACIAL GROUP OF FATHER AND SEX OF CHILD

Racial Group		TOTAL			CITY AREA			RURAL AREA		
		M.		F.	M.		F.	M.		F.
		M. and F.			M. and F.			M. and F.		
Malays	..	11,366	5,868	5,498	7,377	3,792	3,585	3,989	2,076	1,913
Chinese	..	43,275*	22,309	20,965	37,293*	19,319	17,973	5,982	2,990	2,992
Indians and Pakistanis	..	4,299	2,109	2,190	3,891	1,908	1,983	408	201	207
Eurasians	..	351	185	166	322	166	156	29	19	10
Europeans	..	264	132	132	261	130	131	3	2	1
Others	..	375	188	187	330	167	163	45	21	24
Total	..	59,930	30,791	29,138	49,474*	25,482	23,991	10,456	5,309	5,147

* Includes one unknown sex.

The racial group 'Malays' includes 'Indonesians'.

Figures exclude live-births of wives of non-locally domiciled services.

TABLE 6

LIVE-BIRTHS WHICH OCCURRED IN 1961

BY PLACE OF USUAL RESIDENCE OF PARENTS, RACIAL GROUP OF FATHER AND SEX OF CHILD

Place usual Residence	TOTAL			MALAYS		CHINESE		INDIANS AND PAKISTANIS		EURASIANS		EUROPEANS		OTHERS	
	M. and F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
City ..	34,224*	17,592	16,631	2,722	2,585	13,214	12,317	1,340	1,426	67	82	119	93	130	128
Katong ..	9,729	5,030	4,699	1,761	1,629	2,814	2,590	337	344	47	70	5	5	66	61
Serangoon	9,441	4,847	4,594	476	382	3,847	3,687	450	443	39	39	8	6	27	37
Bukit Panjang	3,125	1,630	1,495	270	236	1,181	1,098	167	145	3	4	1	6	8	6
Jurong ..	2,650	1,309	1,341	219	204	1,052	1,090	32	43	3	..	1	..	2	4
Southern Islands ..	633	321	312	232	252	77	51	8	6	2	3	1	..	1	..
Federation of Malaya	106	52	54	12	8	20	18	6	11	1	1	11	14	2	2
Overseas ..	22	10	12	1	1	2	1	1	..	..	1	6	9	..	..
Total ..	59,930*	30,791	29,138	5,693	5,297	22,207	20,852	2,341	2,418	162	200	152	133	236	23

* Includes 1 Unknown sex Chinese.

Figures exclude live-births of wives of non-locally domiciled Services personnel.
The racial group 'Malays' includes 'Indonesians'

TABLE 7

LIVE-BIRTHS WHICH OCCURRED IN 1961

BY PLACE OF USUAL RESIDENCE OF PARENTS, REGISTRATION AREA AND SEX OF CHILD

Place of usual Residence	REGISTRATION AREA								
	TOTAL			CITY AREA			RURAL AREA		
	M. and F.	M.	F.	M. and F.	M.	F.	M. and F.	M.	F.
City ..	34,224*	17,592	16,631	33,925*	17,438	16,486	299	154	145
Katong ..	9,729	5,030	4,699	6,068	3,163	2,905	3,661	1,867	1,794
Serangoon	9,441	4,847	4,594	5,783	2,988	2,795	3,658	1,859	1,799
Bukit Panjang	3,125	1,630	1,495	1,908	1,005	903	1,217	625	592
Jurong ..	2,650	1,309	1,341	1,580	781	799	1,070	528	542
Southern Islands	633	321	312	96	54	42	537	267	270
Federation of Malaya	106	52	54	92	43	49	14	9	5
Overseas ..	22	10	12	22	10	12	..	..	..
Total ..	59,930*	30,791	29,138	49,474*	25,482	23,991	10,456	5,309	5,147

*Includes 1 unknown sex.

Figures exclude live-births of wives of non-locally domiciled Services personnel.

TABLE 8
DEATHS REGISTERED IN 1961
BY REGISTRATION AREA, SEX AND RACIAL GROUP

Racial Group	TOTAL			CITY AREA			RURAL AREA		
	M. and F.	M.	F.	M. and F.	M.	F.	M. and F.	M.	F.
Malays	1,800	998	802	1,140	641	499	660	357	303
Chinese	7,333*	4,277	3,055	6,260*	3,694	2,565	1,073	583	490
Indians and Pakistanis	709	524	185	626	472	154	83	52	31
Eurasians	66	38	28	54	31	23	12	7	5
Europeans	31	23	8	29	22	7	2	1	1
Others	88†	56	28	83†	53	26	5	3	2
Total	10,027‡	5,916	4,106	8,192‡	4,913	3,274	1,835	1,003	832

*Includes 1 unknown sex.
†Includes 4 unknown sex.
‡Includes 5 unknown sex.
(i) The racial group 'Malays' includes 'Indonesians'.
(ii) Figures exclude deaths of non-locally domiciled Services Personnel and their families.

TABLE 9
DEATHS REGISTERED IN 1961
BY PLACE OF USUAL RESIDENCE, RACIAL GROUP AND SEX

Place of usual Residence	TOTAL			MALAYS		CHINESE		INDIANS AND PAKISTANIS		EURASIANS		EUROPEANS		OTHERS	
	M. and F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
City ..	6,296*	3,708	2,583	453	395	2,833	2,033	346	116	12	15	19	5	45	19
Katong ..	1,513	873	640	333	257	458	345	58	24	16	6	2	1	6	7
Serangoon ..	1,300	775	525	84	49	599	430	80	37	8	6	2	1	2	2
Bukit Panjang	385	228	157	34	25	166	126	26	5	2	..	..	1	..	..
Jurong ..	329	201	128	40	32	156	93	5	3	..	..	..	..	..	..
Southern Islands ..	97	55	42	41	34	11	7	3	..	..	1	..	..	..	..
Singapore Unspecified	1	1	..	..	..	1	..	..	..	..	..	..	..	..	..
Federation of Malaya ..	91	64	27	9	8	49	19	4	..	..	..	..	..	2	..
Overseas ..	15	11	4	4	2	4	2	2	..	..	..	..	..	..	..
Total ..	10,027*	5,916	4,106	998	802	4,277	3,055	524	185	38	28	23	8	56	28

*Includes five of unknown sex (1 Chinese and 4 'Others').
The racial group 'Malays' includes 'Indonesians'.
Figures exclude non-locally domiciled Services personnel and their families.

TABLE 10
DEATHS REGISTERED IN 1961
BY PLACE OF USUAL RESIDENCE, REGISTRATION AREA AND SEX

Place of usual Residence	REGISTRATION AREA								
	TOTAL			CITY AREA			RURAL AREA		
	M. and F.	M.	F.	M. and F.	M.	F.	M. and F.	M.	F.
City ..	6,296*	3,708	2,583	6,195*	3,650	2,540	101	58	43
Katong ..	1,513	873	640	819	493	326	694	380	314
Serangoon ..	1,300	775	525	685	438	247	615	337	278
Bukit Panjang ..	385	228	157	193	127	66	192	101	91
Jurong ..	329	201	128	178	118	60	151	83	68
Southern Islands ..	97	55	42	26	17	9	71	38	33
Singapore Unspecified	1	1	..	1	1	..	..	..	..
Federation of Malaya	91	64	27	80	58	22	11	6	5
Overseas ..	15	11	4	15	11	4	..	..	..
Total ..	10,027*	5,916	4,106	8,192*	4,913	3,274	1,835	1,003	832

*Includes 5 of unknown sex.
Figures exclude non-locally domiciled Services personnel and their families.

TABLE 11
DEATHS REGISTERED IN 1961
BY RACIAL GROUP, SEX AND AGE GROUP

Age Group	TOTAL			MALAYS		CHINESE		INDIANS AND PAKISTANIS		EURA- SIANS		EURO- PEANS		OTHERS	
	M. and F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
Under 1 day ..	253†	141	111	36	27	90	72	10	10	1	1	3	1	1	..
1 day and under 2 days ..	191	99	92	19	17	76	68	3	6	1	..	..	..	..	1
2 days and under 3 days ..	154	96	58	22	14	63	37	10	7	..	..	..	..	1	..
3 days and under 4 days ..	100	62	38	19	7	34	26	9	5	..	..	..	..	..	..
4 days and under 5 days ..	50	33	17	12	6	20	9	..	2	1	..	..	..	..	..
5 days and under 6 days ..	41	28	13	10	2	15	10	3	1	..	..	..	..	..	..
6 days and under 7 days ..	38	19	19	4	4	14	13	1	2	..	..	..	..	..	..
7 days and under 14 days ..	128	77	51	18	13	51	34	6	4	..	..	..	..	2	..
14 days and under 21 days ..	62	37	25	9	8	24	17	4	..	..	..	..	..	..	..
21 days and under 28 days ..	42	25	17	12	5	11	9	1	2	..	..	..	..	1	1
Neo-Natal Deaths ..	1,059†	617	441	161	103	398	295	47	39	3	1	3	1	5	2
28 days and under 2 months ..	166	101	65	49	23	43	31	8	9	..	1	..	..	1	1
2 months and under 3 months ..	112	64	48	31	22	27	22	6	3	..	..	..	1	..	..
3 months and under 4 months ..	101	46	55	23	23	21	29	2	2	..	..	..	1	..	..
4 months and under 5 months ..	86	48	38	20	13	23	24	5	1	..	..	..	..	..	..
5 months and under 6 months ..	71	42	29	14	15	22	10	6	4	..	..	..	..	..	..
6 months and under 7 months ..	74	43	31	16	16	26	12	1	3	..	..	..	..	..	..
7 months and under 8 months ..	77	40	37	18	14	18	21	4	2	..	..	..	..	..	..
8 months and under 9 months ..	55	28	27	13	7	11	17	4	3	..	..	..	..	..	..
9 months and under 10 months ..	49	24	25	8	11	16	11	..	1	..	..	..	1	..	1
10 months and under 11 months ..	47	22	25	9	6	12	15	1	3	..	1	..	..	..	..
11 months and under 1 year ..	40	25	15	6	3	15	11	4	1	..	..	..	..	..	..
Infant Deaths* ..	1,937†	1,100	836	368	256	632	498	88	71	3	3	3	4	6	4

*Includes neo-natal deaths.
†Includes one of unknown sex (Chinese).
Figures exclude non-locally domiciled Services personnel and their families.
The racial group 'Malays' includes 'Indonesians'.

TABLE 11—continued

DEATHS REGISTERED IN 1961

BY RACIAL GROUP, SEX AND AGE GROUP

Age Group	TOTAL			MALAYS		CHINESE		INDIANS AND PAKISTANIS		EURA- SIANS		EURO- PEANS		OTHERS	
	M. and F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
Under 1 year ..	1,937†	1,100	836	368	256	632	498	88	71	3	3	3	4	6	4
1 year and under 2 years	311	170	141	80	51	82	77	5	10	1	3	..	..	2	..
2 years and under 3 years	172	93	79	32	29	57	46	4	4	..	..	..	..	..	..
3 years and under 4 years	104	46	58	14	23	28	31	2	3	1	..	..	..	1	1
4 years and under 5 years	78	45	33	14	7	29	26	2	..	..	..	..	..	..	..
5—9 years ..	223	108	115	25	26	74	83	8	4	..	1	1	..	..	1
10—14 years ..	152	95	57	17	17	69	37	8	3	1	..	..	..	..	..
15—19 years ..	146	96	50	14	10	76	37	6	2	..	1	..	..	..	..
20—24 years ..	172	109	63	15	21	86	37	5	4	1	..	1	..	1	1
25—29 years ..	159	94	65	21	16	62	42	10	6	..	..	..	..	1	1
30—34 years ..	179	105	74	15	23	72	47	16	4	..	..	1	..	1	..
35—39 years ..	237	149	88	20	22	90	64	35	2	2	..	2	..	..	..
40—44 years ..	375	235	140	30	32	159	93	38	8	4	1	3	2	1	4
45—49 years ..	506	341	165	36	27	241	125	56	11	1	1	1	..	6	1
50—54 years ..	763	524	239	51	42	397	184	65	11	2	1	5	..	4	1
55—59 years ..	817	552	265	53	37	438	211	53	15	3	1	2	..	3	1
60—64 years ..	1,064	711	353	59	57	593	278	47	9	5	5	..	..	7	4
65—69 years ..	781	484	297	41	26	402	264	31	3	5	3	..	..	5	1
70—74 years ..	787	437	350	40	31	366	307	19	9	3	2	3	..	6	1
75—79 years ..	477	213	264	20	17	177	242	11	1	3	3	..	1	2	..
80—84 years ..	337	126	211	18	16	96	188	10	2	1	2	..	..	1	3
85 years and over	221	64	157	15	14	42	136	3	3	2	1	1	1	1	2
Unknown ..	29*	19	6	..	2	9	2	2	..	..	..	..	..	8	2
Total ..	10,027‡	5,916	4,106	998	802	4,277	3,055	524	185	38	28	23	8	56	28

*Includes four of unknown sex (Others).

†Includes five of unknown sex (Chinese).

‡Includes five of unknown sex.

Figures exclude non-locally domiciled Services personnel and their families.

The racial group 'Malays' includes 'Indonesians'

TABLE 12

DEATHS REGISTERED IN 1961

BY REGISTRATION AREA, SEX AND AGE GROUP

Age Group	TOTAL			CITY AREA			RURAL AREA		
	M. and F.	M.	F.	M. and F.	M.	F.	M. and F.	M.	F.
Under 1 day ..	253†	141	111	†237	134	102	16	7	9
1 day and under 2 days	191	99	92	184	95	89	7	4	3
2 days and under 3 days	154	96	58	145	90	55	9	6	3
3 days and under 4 days	100	62	38	91	57	34	9	5	4
4 days and under 5 days	50	33	17	41	28	13	9	5	4
5 days and under 6 days	41	28	13	39	28	11	2	..	2
6 days and under 7 days	38	19	19	35	19	16	3	..	3
7 days and under 14 days	128	77	51	112	69	43	16	8	8
14 days and under 21 days	62	37	25	47	26	21	15	11	4
21 days and under 28 days	42	25	17	34	21	13	8	4	4
Neo-Natal Deaths ..	1,059†	617	441	†965	567	397	94	50	44
28 days and under 2 months	166	101	65	119	66	53	47	35	12
2 months and under 3 months	112	64	48	81	45	36	31	19	12
3 months and under 4 months	101	46	55	75	32	43	26	14	12
4 months and under 5 months	86	48	38	68	39	29	18	9	9
5 months and under 6 months	71	42	29	48	31	17	23	11	12
6 months and under 7 months	74	43	31	59	34	25	15	9	6
7 months and under 8 months	77	40	37	63	31	32	14	9	5
8 months and under 9 months	55	28	27	42	20	22	13	8	5
9 months and under 10 months	49	24	25	34	17	17	15	7	8
10 months and under 11 months	47	22	25	36	16	20	11	6	5
11 months and under 1 year	40	25	15	36	23	13	4	2	2
Infant Deaths* ..	1,937†	1,100	836	1,626†	921	704	311	179	132

*Includes neo-natal deaths.

†Includes one of unknown sex.

Figures exclude non-locally domiciled Services personnel and their families.

TABLE 12 — *continued*

DEATHS REGISTERED IN 1961

BY REGISTRATION AREA, SEX AND AGE GROUP

Age Group	TOTAL			CITY AREA			RURAL AREA		
	M. and F.	M.	F.	M. and F.	M.	F.	M. and F.	M.	F.
Under 1 year ..	1,937†	1,100	836	1,626†	921	704	311	179	132
1 year and under 2 years	311	170	141	212	114	98	99	56	43
2 years and under 3 years	172	93	79	120	65	55	52	28	24
3 years and under 4 years	104	46	58	72	33	39	32	13	19
4 years and under 5 years	78	45	33	65	36	29	13	9	4
5— 9 years ..	223	108	115	196	95	101	27	13	14
10—14 years ..	152	95	57	128	87	41	24	8	16
15—19 years ..	146	96	50	130	90	40	16	6	10
20—24 years ..	172	109	63	155	104	51	17	5	12
25—29 years ..	159	94	65	144	88	56	15	6	9
30—34 years ..	179	105	74	159	98	61	20	7	13
35—39 years ..	237	149	88	208	131	77	29	18	11
40—44 years ..	375	235	140	327	211	116	48	24	24
45—49 years ..	506	341	165	429	290	139	77	51	26
50—54 years ..	763	524	239	656	460	196	107	64	43
55—59 years ..	817	552	265	692	477	215	125	75	50
60—64 years ..	1,064	711	353	872	594	278	192	117	75
65—69 years ..	781	484	297	630	403	227	151	81	70
70—74 years ..	787	437	350	609	329	280	178	108	70
75—79 years ..	477	213	264	353	148	205	124	65	59
80—84 years ..	337	126	211	224	79	145	113	47	66
85 years and over ..	221	64	157	158	41	117	63	23	40
Unknown ..	29‡	19	6	27‡	19	4	2	..	2
Total ..	* 10,027	5,916	4,106	* 8,192	4,913	3,274	1,835	1,003	832

* Includes five of unknown sex.

† Includes one of unknown sex.

‡ Includes four of unknown sex.

Figures exclude non-locally domiciled Services personnel and their families.

TABLE 13
LIVE-BIRTHS AND CRUDE BIRTH RATES

Racial Group	1931		1947		1957		1958		1959		1960		1961	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
Malays	2,862	43.7	5,473	48.1	9,317	47.3	10,005	48.3	10,463	48.1	10,577	46.5	10,990	46.5
Chinese	15,993	37.9	33,629	46.1	46,263	42.4	46,189	40.5	45,799	38.5	44,964	36.5	43,060	33.9
Indians and Pakistanis	1,020	19.6	3,087	44.8	5,020	40.5	5,116	39.5	5,073	37.7	5,084	36.9	4,759	33.6
Eurasians	199	28.5	359	39.4	360	31.6	362	30.9	341	28.3	362	29.7	362	28.3
Europeans	169	20.6	312	8.9	355	32.8	338	29.8	286	23.4	318	25.0	285	21.3
Others	227	29.1	185	24.6	442	36.8	485	39.5	502	37.6	470	35.1	474	33.6
Total	20,470	36.4	43,045	45.9	61,757	42.7	62,495	41.3	62,464	39.5	61,775	37.8	59,930	35.5
Males	10,753	..	22,152	..	31,795	..	32,180	..	32,061	..	31,990	..	30,791	..
Females	9,717	..	20,893	..	29,957	..	30,313	..	30,403	..	29,785	..	29,138	..
Total	20,470	..	43,045	..	61,757*	..	62,495*	..	62,464	..	61,775	..	59,930*	..
Male births per 100 births	..	52.5	..	51.5	..	51.5	..	51.5	..	51.3	..	51.8	..	51.4

*Includes unknown sex.

(i) The racial group 'Malays' includes 'Indonesians'.
(ii) Figures for 1957—1961 exclude live-births of wives of non-locally domiciled Services personnel.

TABLE 14
DEATHS AND CRUDE DEATH RATES

Racial Group	1931		1947		1957		1958		1959		1960		1961	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
Malays	1,905	29.1	2,029	17.8	1,967	10.0	1,931	9.3	1,790	8.2	1,758	7.7	1,800	7.6
Chinese	10,599	25.1	9,368	12.8	7,696	7.1	7,613	6.7	7,431	6.2	7,469	6.1	7,333	5.8
Indians and Pakistanis	820	15.8	878	12.7	791	6.4	792	6.1	757	5.6	769	5.6	709	5.0
Eurasians	103	14.8	84	9.2	75	6.6	87	7.4	71	5.9	74	6.1	66	5.2
Europeans	51	6.2	74	2.1	38	3.5	65	5.7	42	3.4	58	4.6	31	2.3
Others	145	18.6	78	10.4	80	6.7	88	7.2	84	6.3	82	6.1	88	6.2
Total ..	13,623	24.2	12,511	13.3	10,647	7.4	10,576	7.0	10,175	6.4	10,210	6.2	10,027	5.9

(i) The racial group 'Malays' includes 'Indonesians'.
(ii) Figures for 1957—1961 exclude deaths of non-locally domiciled Services personnel and their families.

INFANT DEATHS AND INFANT MORTALITY RATES, 1961			
Racial Group		Number	Rate
Malays	..	624	56.8
Chinese	..	1,131	26.3
Indians and Pakistanis	..	159	33.4
Eurasians	..	6	16.6
Europeans	..	7	24.6
Others	..	10	21.1
Total ..		1,937	32.3

(i) The racial group 'Malay' includes 'Indonesians'.
(ii) Figures exclude live-births of wives of non-locally domiciled Services Personnel.

TABLE 16

STILL-BIRTHS AND STILL-BIRTH RATES

Year			Still-births	Still-births Rate	Year			Still-births	Still-births Rate
1931	..	..	568	27.0	1947	..	..	671	15.3
1932	..	..	528	24.8	1948	..	..	753	16.7
1933	..	..	527	23.9	1949	..	..	803	17.1
1934	..	..	586	25.1	1950	..	..	807	17.1
1935	..	..	650	24.5	1951	..	..	802	16.4
1936	..	..	693	24.1	1952	..	..	901	17.3
1937	..	..	755	24.7	1953	..	..	925	16.7
1938	..	..	783	24.0	1954	..	..	932	16.1
1939	..	..	814	23.0	1955	..	..	904	15.4
1940	..	..	719	20.8	1956	..	..	909	14.7
1941	..	..	816	23.2	1957	..	..	968	15.4
1942	..	..	467	16.6	1958	..	..	965	15.2
1943	..	..	599	18.8	1959	..	..	862	13.6
1944	..	..	610	18.9	1960	..	..	886	14.1
1945	..	..	459	18.4	1961	..	..	766	12.6
1946	..	..	645	16.4					

Figures for 1957–1961 exclude still-births of wives of non-locally domiciled Services Personnel.

TABLE 17

MATERNAL DEATHS AND MATERNAL MORTALITY RATES

Year			Maternal Deaths	Maternal Mortality Rate	Year			Maternal Deaths	Maternal Mortality Rate
1931	..	..	158	7.5	1947	..	..	125	2.9
1932	..	..	160	7.5	1948	..	..	108	2.4
1933	..	..	128	5.8	1949	..	..	102	2.2
1934	..	..	111	4.8	1950	..	..	86	1.8
1935	..	..	100	3.8	1951	..	..	80	1.6
1936	..	..	103	3.6	1952	..	..	87	1.7
1937	..	..	134	4.4	1953	..	..	68	1.2
1938	..	..	154	4.7	1954	..	..	88	1.5
1939	..	..	140	4.0	1955	..	..	52	0.9
1940	..	..	148	4.3	1956	..	..	45	0.7
1941	..	..	146	4.1	1957	..	..	55	0.9
1942	..	..	160	5.7	1958	..	..	50	0.8
1943	..	..	139	4.4	1959	..	..	45	0.7
1944	..	..	131	4.1	1960	..	..	28	0.4
1945	..	..	179	7.2	1961	..	..	24	0.4
1946	..	..	128	3.3					

Figures for 1957–1961 exclude deaths of wives of non-locally domiciled Services Personnel.

TABLE 18

MIGRATION STATISTICS BY SEA AND AIR DURING 1961

Arrivals

Racial Group	ADULTS		CHILDREN*		Total
	Males	Females	Males	Females	
Malays	12,840	5,433	982	756	20,011
Chinese	22,056	11,024	1,003	656	34,739
Indians and Pakistanis ..	14,160	3,671	1,390	947	20,168
Eurasians	330	164	46	37	577
Europeans	44,070	23,330	3,621	2,661	73,682
Others	9,242	1,753	343	241	11,579
Total ..	102,698	45,375	7,385	5,298	160,756

* Under 12 years of age.

Departures

Racial Group	ADULTS		CHILDREN*		Total
	Males	Females	Males	Females	
Malays	12,464	5,014	960	662	19,100
Chinese	25,288	11,966	1,050	631	38,935
Indians and Pakistanis ..	25,444	4,790	2,173	1,857	34,264
Eurasians	379	179	49	28	635
Europeans	43,622	24,284	4,011	2,997	74,914
Others	8,910	1,523	266	178	10,877
Total ..	116,107	47,756	8,509	6,353	178,725

* Under 12 years of age.

The racial group 'Malays' includes Indonesians.

PART II
HEALTH DIVISION

Chapter Four

INTRODUCTION

THE State of Singapore comprises the main island of Singapore with several small surrounding islands within its territorial waters. The main island is 27 miles long, and 14 miles wide with a land area of 216 square miles. The area of the smaller islands is about 10 square miles.

Up to 1959, for administrative purposes, the island was divided up into a densely populated city area of 31 square miles and a larger and relatively sparsely populated rural area. The Health Services were up to that time carried on by two local authorities, namely the Rural Board and the City Council; and by the Government Health Department, under the direction of the Director of Medical Services. The City Health Department was responsible for all the Environmental and some Personal Health Services in the City area, while the rest of the Personal Health Services and the environmental health service in the Rural area were carried on by the Government Health Department and the Rural Board respectively.

In 1957, the new Local Government Ordinance was passed, and decentralisation of environmental health services was commenced in 1958 in accordance with this Ordinance. However, it was only in 1959 that effective decentralisation was achieved with the formation of three District Councils.

In late 1959, with the realisation that the mounting cost of curative treatment could only be mitigated by the progressive expansion of preventive measures, the Government enunciated a policy of expansion of its Preventive Health Services and this included the integration of the Local Authority Health Departments into the structure of the Ministry of Health.

Accordingly in 1960, the first phase of physical integration took place, and the second phase of financial integration was effected in 1961. Integration has been accomplished in broad principles. There still remains, however, a few matters which have not been defined; and which because of statutory necessity are still being administered by the City Council and the Rural Board.

At the end of 1961, further re-organisation of the Ministry was undertaken and in the new set up, the Public Health Division was formed and is now directly under the charge of the D.D.M.S. (Health). There has been regrouping of the various sections, and public health policy is now more effectively co-ordinated and operated. The present organisation is shown in Chart I (below).

The Public Health Division is responsible for Preventive Health Services and this broadly includes:

- (1) Environmental Health;
- (2) Quarantine and Epidemiology;
- (3) Personal Health Services; and
- (4) Training and Health Education.

THE ENVIRONMENTAL HEALTH SERVICES

These services maintain effective control of (1) general sanitation, (2) sale of food and drugs, and (3) infectious diseases and malaria control. The main feature of the work done during the year was the maintenance of the existing health services at their previous high level and further extensions of these services to meet the rapid increase of population. In the rural areas, rapid development is taking place, in the form of housing estates and consequently these estates now house large populations so that the higher urban standards are, of necessity, being enforced in such developing areas. Routine work carried out by these services includes the inspection of places where food is prepared and sold, premises used for offensive trades, house inspections, investigation of nuisances, inspection of licensed premises on behalf of various Government Departments and the control of infectious diseases.

THE EPIDEMIOLOGICAL AND QUARANTINE SERVICES

The Epidemiological Section is newly created with re-organisation, and logically has been grouped together with Quarantine.

The functions of this Section are to keep up-to-date epidemiological information with regard to all notifiable infectious diseases. This includes analyses, evaluations and reports on epidemiological data. The Section is in its infancy.

The Quarantine Service is comprised of 3 closely related sections, namely:

- (1) the Marine Port Health Services,
- (2) the Airport Health Services,
- (3) the Quarantine Station.

The services are organised so that an effective barrier against the introduction of disease from neighbouring and other countries is maintained. Large numbers of passengers, ships, crews, and air crews pass through Singapore on account of its strategic geographical position, and there is no doubt that the danger of introduction of disease, in particular the dangerous infectious disease, is a very real one. That Singapore has been able to prevent this is due to the untiring efforts of the Quarantine Service. A round-the-clock service was started in June, 1961 in the Port Health Section to meet a long standing need of clearing vessels arriving during the night.

Mention must be made of the fact that though the Environmental Health Branch control infectious diseases throughout the State, the control of yellow fever and malaria within a 800 metre radius of the airport area is under the jurisdiction of the Quarantine Section.

THE PERSONAL HEALTH SERVICES

Maternal and Child Health Services. These services, with integration, are now carried out on an islandwide basis. The service operates a network of major clinics, visiting centres and midwife stations throughout the City and Rural areas. There are 20 main clinics in the rural area and 7 in the City. In addition, there are 22 visiting centres and 8 village midwife centres. The

service to mothers consists of ante-natal and post-natal care, a Domiciliary Midwifery Service and a Domiciliary After-Care Service. The facilities made available for infant care have now been extended to children up to the school-going age. Services include preventive and curative work. A comprehensive immunisation programme is offered to all children. This includes vaccination against small-pox, immunisation against diphtheria, whooping cough and tetanus, and BCG vaccination. This immunisation programme is carried on at all the clinics, as well as by a mobile team which serves the more outlying Rural areas. Attendances at Maternal and Child Health Clinics have increased during the last few years and, in 1961, there was a total of 667,270 visits by infants and toddlers, some 34,000 in excess of 1960, and 140,013 visits by mothers to ante-natal clinics, compared with 133,567 in 1960.

The School Health Service. This service is centrally administered and functioned at the Institute of Health. The service is responsible for the prevention of diseases and the promotion and maintenance of health among school children. In 1961, 93,402 pupils were examined, representing 24.6 per cent of the school population. Of a total of 695 Government and Government-aided schools, 560 were visited by a Health Officer during the year. There are 4 school clinics, viz. at the Institute of Health, Paya Lebar, Kallang and Bukit Timah. These clinics deal with follow-ups from the routine school examination. There are also travelling dispensaries which visit school children in the more remote Rural areas

During the year, the School Health staff actively participated in the Anti-Cholera Inoculation Campaign and during the period from 11th September, 1961 to 31st October, 1961, eight teams covered practically all the schools in the State and inoculated some 350,000 school children.

Revision of the existing school regulation and drafting of new legislation for the control of kindergartens is now being carried out by the Ministry of Education.

HEALTH EDUCATION AND TRAINING

Health Education. Considerable emphasis has been given to the development of Health Education. The Mass Tuberculosis X-ray Campaign conducted during the year owed its success largely to the Health Education Campaign preceding it. The Family Planning Campaign started in 1960, was followed up and sustained in 1961. The Health Education Section produced its first issue of a news-letter *School Health* at the end of the year.

Training. Training of Public Health Inspectors is carried out at the Institute of Health and is one of the oldest courses of training in Singapore, having been started in 1921. The 9-month course leads to Diploma of the Royal Society of Health.

Training of Public Health Nurses was started in November 1957, under the direction of a W.H.O. Public Health Nurse Tutor. The course, which is of a year's duration, leads to the Health Visitors Certificate also of the Royal Society of Health. Since its inauguration, 31 nurses have received this Certificate.

MAJOR EVENTS OF PUBLIC HEALTH SIGNIFICANCE

Jurong Industrial Site. The Jurong Industrial Scheme was commenced during 1961. 18,000 acres of hills are to be levelled and swamps reclaimed on the West Coast to convert the area into an industrial centre. A satellite town is envisaged and preliminary anti-malarial measures in the form of oiling have been instituted over part of the industrial development area to forestall any outbreak of malaria.

The Bukit Ho Swee Fire. One of the major disasters affecting the State was the Bukit Ho Swee fire which occurred in May 1961. Some 16,000 people were affected. Two relief centres at Kim Seng Road were organised. The staff of the Public Health Division rendered emergency service working in shifts, and maintaining environmental sanitation in these overcrowded centres, as well as attending to the dietary and medical needs of all the victims, both adults and children.

Strike by the daily-rated staff of Government and City Council. This strike took place in the latter part of the year from October 31st–24th November, and during this period the departments affected in the Ministry of Health (principally the Public Health Inspectorate, the Cleansing, Hawkers and Markets, and Anti-Mosquito Departments) operated from the Works Brigade Headquarters at Kolam Ayer Lane.

The Departments worked in close co-operation with other Departments of Government and the City Council. A skeleton service was provided during the period with casual labourers employed on a day-to-day basis. Work was carried on under the protection of Police and Military escorts. The public co-operated willingly and this helped considerably towards the maintenance of essential services during this period.

Anti-cholera Immunisation Campaign. Although Singapore did not witness any dangerous infectious disease, namely small-pox, plague, cholera, typhus fever, yellow or relapsing fever in 1961, cholera epidemics broke out in the Borneo Territories, the Philippines, Hongkong and Macao. In view of the proximity of Singapore to these epidemic areas, a Cholera Inoculation Campaign was organised by the Division, and this was conducted on an island-wide basis. Some 474,000 persons were inoculated, and this was carried out by the Personal Health Service. An import ban was imposed on fresh vegetables, fruits, fish and meat products from China, Hongkong and Taiwan from 11th September, 1961 to 3rd November, 1961. This was necessary in view of the large trade in these articles between Singapore and Hongkong.

ANTI-CHOLERA IMMUNIZATION CAMPAIGN



Cholera Immunization on one of the Islands



Cholera Immunization at a Maternal and Child Health Clinic



Cholera Immunization of School Children in one of the Rural Schools

Table 19 gives Vital Statistics for the past 5 years.

TABLE 19

	1957		1958		1959		1960		1961	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
Live Births ..	61,757	42.7*	62,495	41.3	62,464	39.5	61,775	37.8	59,930	35.5
Still Births ..	968	15.4†	965	15.2	862	13.6	886	14.1	766	12.6
Perinatal deaths ..	1,775	28.3‡	1,839	29.0	1,666	26.3	1,747	27.9	1,593	26.2
Neonatal deaths ..	1,101	17.8†	1,186	19.0	1,080	17.3	1,093	17.7	1,059	17.7
Infant deaths (birth—1 year) ..	2,557	41.4§	2,733	43.7	2,249	36.0	2,158	34.9	1,937	52.3
Maternal deaths ..	55	0.9¶	50	0.8	45	0.7	28	0.4	24	0.39

* The Crude Birth rate — Number of live births/1,000 mid-year population.
† The Still Birth rate — Number of still births/1,000 still and live births.
‡ The Perinatal Mortality rate — Number of deaths under 7 days of age plus still births/1,000 still and live births.
§ The Neonatal Mortality rate — Number of deaths under 28 days of age/1,000 live births.
¶ The Infant Mortality rate — Number of deaths under 1 year of age/1,000 live births.
¶¶ The Maternal Mortality rate — Number of maternal deaths per 1,000 total live and still births.

These figures have been obtained from the 1960 Report on the Registration of births and deaths, marriages and persons, and from the monthly demographic bulletins for the State of Singapore for 1961 and 1962.

Table 20 gives the Infant Mortality Rate by ethnic groups for 1960 and 1961.

TABLE 20

	<i>1960</i> <i>Infant Mortality Rate</i>	<i>1961</i> <i>Infant Mortality Rate</i>
All Races	34.9	32.3
Malaysians	65.0	56.8
Chinese	28.3	26.3
Indians	33.4	33.4
Eurasians	13.8	16.6
Europeans	25.2	24.6
Others	29.8	21.1

Table 21 gives the Perinatal Mortality Rate by ethnic groups for 1960 and 1961.

TABLE 21

	<i>1960</i> <i>Perinatal Mortality Rate</i>	<i>1961</i> <i>Perinatal Mortality Rate</i>
All Races	27.9	26.2
Malaysians	35.3	36.3
Chinese	25.9	22.6
Indians	30.8	36.0
Eurasians	11.0	24.5
Europeans	25.0	27.7
Others	35.3	22.8

Chapter Five

ENVIRONMENTAL HEALTH SERVICES

HYGIENE AND SANITATION

Water Supplies

The provision of a safe water supply is one of the most important public health measures. A piped water supply is available in the City area and in most of the villages close to the main roads, but the remote kampongs still depend on wells. The wells in the Rural areas are found to a large extent to be grossly polluted because of the existence of insanitary dwelling, privies and piggeries in the immediate vicinity of these wells. Extensions to water mains are being laid down yearly. Standpipes and wells are also being erected each year. The standpipes in 1961 were installed by the City Water Department and the Rural Board, while the Environment Health Services provided concrete aprons for the standpipes, and maintained existing wells. New wells which are constructed by the Health Department under the Kampong Sanitation Scheme are deep wells and are provided with parapet walls and covers as a precautionary measure against children falling into wells. In areas where permanent drainage has been constructed as an anti-malarial measure, relatively safe water from sub-soil pipes is available, both for drinking and washing purposes.

During 1961, Singapore experienced a long period of draught. This commenced some time in August and continued to the end of the year. Water in service reservoirs on the island fell to a level not experienced hitherto, and water rationing was brought into force from 1st September, 1961 to the first week of January, 1962.

Despite the acute water shortage, there was no unusual occurrence of dysenteric disease noted in the area under civil administration. There was, however, an outbreak of Sonne dysentery at the R.A.F. Seletar.

On 30th August, 1961 an explosive outbreak of diarrhoea and vomiting began at R.A.F. Seletar. Pathological specimens from the early cases showed the infection to be due to *Shigella Sonne*. The cases came from all sections of the station and included the Asian inhabitants of Seletarville. Over 1,100 cases occurred in the outbreak, many of them of a mild nature. The rapidity of onset and the universal distribution strongly pointed to a water borne outbreak, and samples of camp water were immediately examined.

Residual chlorine was not found in the camp water supply and immediately heavy hand chlorination of the camp tanks was commenced. With investigations proceeding with the City Water Engineers working in conjunction with the R.A.F. Seletar A.M.W.D. and Medical Department, a fractured service pipe was discovered in a highly polluted drain in a shop which may have been responsible for the outbreak and that pollution must have occurred during pressure fluctuations a day or two preceding the outbreak, these pressure fluctuations having arisen because of the water shortage affecting Singapore generally.

Numerous measures were taken to control and limit the outbreak. These included the following:

- (1) chlorination of all supplies of water: boiling of drinking water and regular bacteriological control of the water supply;
- (2) centralisation of all catering facilities under strict hygiene control;
- (3) mass treatment of cases and advice on hygiene to all personnel and families;
- (4) anti-fly measures;
- (5) closure of clubs and canteens not essential for camp feeding;
- (6) bacteriological screening of food handlers and children returning to school.

Offensive and Dangerous Trades

Offensive and dangerous trades are controlled by licensing under the Municipal Ordinance, Chapter 133, section 211 together with the Rural Board Offensive Trade By-laws. These laws provide for sanitary requirements, adequate lighting, ventilation, drainage, adequate and wholesome water supply, and satisfactory safeguards to meet occupational hazards. In the Rural area, there are numerous small trades and cottage industries springing up, and to reduce hazards which are bound to occur with primitive methods employed, the Factories Ordinance was passed in 1958. This Ordinance has done much to improve accommodation, houses of work, wages, bonus benefits, leave and other matters pertaining to the workers' health.

During the year, 7,396 inspections were carried out on business premises in the Rural area and another 43,083 inspections of premises were carried out in the City area. These inspections are made with the object of putting up recommendations with regard to licensing, registration and renewal of licences by other licensing authorities.

Kampong Sanitation

Kampong sanitation in both the Rural and City areas continued to expand throughout the year. Under the scheme of kampong sanitation commenced in 1954, forty six kampongs were sanitated in the Rural area and another four in the City area during 1961. This work was carried out by the Anti-Mosquito Department Section as it involved the provision of adequate drainage facilities, sanitary latrines and wells, repair of platforms to stand-pipes. In addition to this, maintenance works were carried out in these kampongs already sanitated.

The Cleansing Services

The City and Rural cleansing services function on a district basis. The functions carried on by the Rural Board and the City Cleansing Department have been integrated and are now centrally administered through the Ministry of Health under the Senior Health Officer (Environmental Health). The Section is responsible for the cleansing (streets and drains) and conservancy services, and for the collection and disposal of refuse and nightsoil.

Removal of refuse is done daily in the City area from houses and business premises along main roads, public streets, and housing estates. Refuse is collected either as domestic refuse or trade refuse. The collection and disposal of domestic refuse is performed with no charge, but owners of trade premises are charged for this service.

THE CONTROL OF INFECTIOUS DISEASES AND MALARIA

The Notifiable Infectious Diseases

The control of infectious diseases is exercised through the Quarantine and Prevention of Infectious Diseases Ordinance (Chapter 147) and its regulations. Barring a few reservations, the Ministry of Health also complies with the International Sanitary Regulations laid down by W.H.O.

Infectious diseases are divided into two broad categories under the Quarantine and Prevention of Infectious Diseases Ordinance.

- (1) The dangerous infectious diseases which are quarantinable. These are small-pox, plague, cholera, epidemic or louse borne typhus, yellow fever.
- (2) Notifiable infectious diseases. These include anthrax, cerebro spinal fever, chicken-pox, diphtheria, enteric fever, crysipelas, leprosy, puerperal fever, scarlet fever, tuberculosis and the 6 dangerous infectious diseases.

In 1961, Singapore did not witness any dangerous infectious disease despite its proximity to territories in which these diseases are either epidemic or endemic.

Table 22 shows the incidence of the main notifiable diseases for 1961.

TABLE 22

Disease	City	Rural	Total
Typhoid	89	73	162
Diphtheria	461	145	606
Chicken-pox	1,068	574	1,642
Poliomyelitis	22	35	57
Cerebro spinal fever	1	—	1
Leprosy	62	39	101
Typhus*	1	4	5
Puerperal Fever	29	8	37

*Under the heading, typhus are included Tsutsugumushi or Scrub Typhus of Malaya (mite borne) and flea borne Urban Type Tropical Typhus. Louse borne typhus has not been seen in Singapore.

The figures for tuberculosis are not included in this report as tuberculosis (since 1959) is notified directly to the A.D.M.S. (T.B.) at Tan Tock Seng Hospital.

DIPHTHERIA

The incidence of this preventable disease is still high in the country with 606 cases notified during the year. Although diphtheria immunisation has been available to the child population since 1948, after 14 years of free immunisation on a voluntary basis, the response is still poor, and only about 45 per cent of infants are immunised at Infant Welfare Centres.

Table 23 gives the monthly notifications for diphtheria for 1961.

TABLE 23

Diphtheria 1961	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
City ..	44	43	36	41	45	28	42	33	43	50	18	38	461
Rural ..	19	8	7	9	14	13	10	9	10	16	11	19	145
Total ..	63	51	43	50	59	41	52	42	53	66	29	57	606

Table 24 gives the incidence of diphtheria by sex, ethnic group and by age.

TABLE 24

DIPHTHERIA CASES NOTIFIED AND CONFIRMED IN 1961
UNDER 5 YEARS OF AGE

(Resident and Non-Resident)

Races	0—1 Year		1—2 Years		2—3 Years		3—4 Years		4—5 Years		Total under 5 years	Total over 5 years
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.		
Europeans ..	..	..	..	..	..	..	..	..	..	1	1	..
Eurasians ..	..	..	..	..	..	..	..	..	..	1	1	1
Chinese ..	39	23	50	38	32	32	24	23	24	22	306	216
Malays ..	2	3	5	5	2	1	6	3	1	2	29	16
Indians ..	1	..	1	3	2	4	2	2	1	3	19	13
Others ..	..	..	..	..	..	..	..	..	..	..	..	4
Total ..	42	26	56	46	36	37	32	28	26	29	356	250

To counteract the apathy on the part of the public after 14 years of voluntary immunisation, the Ministry of Health decided that legislation to control diphtheria should be introduced. Accordingly in April this year, legislation was enacted in the form of the Diphtheria Immunisation Ordinance, 1961. The Ordinance provides for compulsory immunisation against diphtheria for every child (a) within 12 months of birth, or (b) who is under 7 years of age and who has not been previously immunised against diphtheria. It also provides for two booster immunisations — (a) upon attaining the age of 4 years, provided 3 years have elapsed since primary diphtheria inoculation, and (b) within 12 months of entering primary school. It is hoped that the Ordinance and its regulations will be enforced early in 1962.

POLIOMYELITIS

Table 25 shows the monthly incidence of poliomyelitis for 1961.

TABLE 25

Poliomyelitis 1961	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
City ..	2	2	1	2	..	3	2	1	6	2	1	..	22
Rural ..	3	1	5	3	..	..	3	1	9	5	3	2	35
Total ..	5	3	6	5	..	3	5	2	15	7	4	2	57

Table 26 gives the incidence of poliomyelitis by age, sex and ethnic group.

TABLE 26

POLIOMYELITIS

CONFIRMED CASES NOTIFIED IN 1961 BY RACES, SEX AND AGE GROUPS

Table includes imported cases as well as in City Resident
(Cases in service personnel and families included)

	Europeans			Eurasians			Chinese			Malays			Indians			Others			Total		
	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.
0— 5 years	16	15	31	3	2	5	3	1	4	..	..	..	22	18	40
5—10 years	3	1	4	..	..	..	..	..	..	..	..	..	3	1	4
10—15 years	2	..	2	..	..	..	1	..	1	..	..	..	3	..	3
15—20 years	2	2	..	..	..	..	..	..	..	..	..	..	2	2
20—25 years
25—35 years	2	..	2	..	..	1	..	1	..	..	..	1	..	1	..	..	..	4	..	4
35—45 years	1	..	1	..	..	1	..	1	..	..	..	..	..	..	..	..	..	2	..	2
45—55 years	1	..	1	1	..	1
55—65 years	1	..	1	..	..	..	..	..	..	..	..	..	1	..	1
Total ..	3	..	3	..	..	..	24	18	42	3	2	5	5	1	6	1	..	1	36	21	57

Table 27 shows poliomyelitis notifications under and over 5 years of age by second ethnic groups.

TABLE 27

POLIOMYELITIS CASES NOTIFIED AND CONFIRMED IN 1961

UNDER 5 YEARS OF AGE

(Resident and Non-Resident)

(Cases in service personnel and families included)

Races		0—1 Year		1—2 Years		2—3 Years		3—4 Years		4—5 Years		Total under 5 years	Total over 5 years
		M	F	M	F	M	F	M	F	M	F		
Europeans ..	..	..	..	..	..	..	..	..	..	..	..	..	3
Eurasians ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Chinese ..	..	4	2	2	5	5	4	2	4	3	..	31	11
Malays ..	..	2	1	..	1	1	..	..	..	..	..	5	..
Indians ..	..	1	..	1	1	1	..	..	..	..	..	4	2
Others ..	..	..	..	..	..	..	..	..	..	..	..	..	1
Total ..	..	7	3	3	7	7	4	2	4	4	3	40	17

Plans were formulated in 1961 to start a Polio Immunisation Campaign in 1962, using Sabin oral vaccine. It is envisaged that 300,000 children in the vulnerable age group will be immunised during this campaign. It is also hoped immunisation against polio in the near future will be part of the regular Maternal and Child Health and the School Health Immunisation programmes. With this materialising, polio will in the near future be controlled or even eradicated.

LEPROSY

The incidence of leprosy shows a definite decrease as compared with 1960. Below are the figures for leprosy for 1951, 1960 and 1961.

		1951	1960	1961
City	...	142	119	62
Rural	...	79	27	39
Total	...	221	146	101

The incidence of the disease has shown a definite drop since 1951, and this confirms the view that the disease is being slowly brought under control. This is mainly due to the fact that the people know there is a cure for leprosy and tend to come forward voluntarily for treatment.

Anti-Malarial Section

There are three Departments with highly experienced technical staff who are responsible for malarial control. They are the City Council Health Department, the Armed Forces Medical Department and the Government Health Division. These three Departments have been carrying on this work for the last 25 years. The main method adopted by all three has been larvel control of the two most important vectors, *Anopheles maculatus* and *Anopheles sundaicus*. This entails the laying of sub-soil pipes, construction of permanent surface drains, digging of ditches and the use of anti-malarial oil and insecticide. A constant vigil is kept on the prevention of malaria, and though Singapore has been free from indigenous malaria for the past 10 years, there has been no room for complacency and the anti-malarial programme is adhered to rigidly.

Anti-malarial work is now being carried out in conjunction with kampong sanitation, so that drain construction works performed during 1961 were of a combined type, i.e. the drains served a dual purpose of an anti-malarial measure and improving kampong sanitation at the same time.

Close liaison was maintained not only with the armed forces but with Government and semi-government organizations, like the Malayan Railway Authorities and the Singapore Harbour Board Authorities in relation to the control of malaria.

Throughout the year, maintenance of anti-malaria works was carried out. This includes maintenance and repairs of concrete drains, sub-soil drains and earth drains.

Below are details of repair and maintenance to drains in the Rural and City areas:

Rural

Concrete drains repaired	...	...	4,056 yards run
Subsoil drains repaired	...	...	7,641 yards run
Wash wells repaired	...	...	19 yards run
Standpipe aprons repaired	...	...	59 yards run
Blukar and other vegetation cleared	...	...	12 acres

City

Concrete drains	...	...	184,055 yards run
Earth drains	...	...	479,593 yards run
Water bearing and other receptacle received and disposed off	...	...	1,931

Larvicidal Measures.—A total of 213,946 gallons of anti-malarial mixture was used. Of this 140,277 gallons were used in the Rural area, and the remaining 73,669 gallons were used in the City area. To ensure that the anti-malarial mixtures are effective and comply specifications, regular field and laboratory tests were carried out. Apart from routine oiling to control malaria, the department had to deal with many pest mosquito breeding places. Breeding places are also created through housing and agricultural developments, specially in the Rural area.

Oil mixtures used as larvicides included:

- (1) Shell malarial emulsion;
- (2) Gammexane powder;
- (3) Shell malarial H.S;
- (4) anti-malarial mixture with 10 per cent D.D.T.;
- (5) benzine with 10 per cent D.D.T.;
- (6) Dioldrex 15.

New Oiling Areas.—The 10th mile village at Jurong and part of the Jurong Industrial Site were brought under malarial control by oiling during 1961. Following the Bukit Ho Swee Fire in May, two rounds of mass oiling of the whole burnt out area were carried out as an immediate and emergency measure against mosquitoes and flies.

Tables 28-31 are summary reports of anti-malarial work done in the City and Rural areas.

TABLE 28

SUMMARY REPORT ON PERMANENT ANTI-MALARIAL AND KAMPONG
SANITATION CONSTRUCTION WORKS CARRIED OUT IN RURAL
SINGAPORE DURING THE YEAR 1961

Serial Number	Particulars	
1.	Length of Channel drains constructed 2.7 miles ...	4,821 yards
2.	Length of subsoil pipe lines laid ...	924 yards
3.	Length of earth drains out and graded 1.4 miles ...	2,637 yards
4.	Length of drain sides and side tables turfed ...	230 yards
5.	Length of drain sides slabbed ...	2,332 yards
6.	Length of storm water bunds ...	30 yards
7.	Length of stick drains ...	5 yards
8.	Length of foot ways cemented ...	120 yards
9.	Length of Road filled and levelled ...	100 yards
10.	Number of A.M. wells constructed ...	3 yards
11.	Number of A.M. standpipe aprons ...	11 yards
12.	Number of A.M. retaining walls constructed ...	13 yards
13.	Number of A.M. culverts constructed ...	24 yards
14.	Number of A.M. bored hole latrines ...	18 yards
15.	Number of A.M. R.C. slabs constructed over drain ...	10 yards
16.	Number of A.M. bridge (timber) ...	4 yards
17.	Number of A.M. Sand trap ...	1 yard
18.	Number of A.M. well aprons ..	2 yards
19.	Number of A.M. Spill-ways ..	2 yards
20.	Number of A.M. Junction Chambers ...	5 yards
21.	Number of A.M. Over-hang latrines ...	4 yards

In all 46 jobs been carried out.

	\$	c.
Total cost for Katong District ...	26,413	85
Total cost for Bukit Panjang/Jurong Districts ...	42,065	95
Total cost for Serangoon District ...	57,872	49
Grand Total ...	126,352	29

TABLE 29

SUMMARY OF CITY ANTI-MALARIAL WORKS AND COSTS
FOR THE YEAR 1961

Particulars	Labour	MATERIALS			Total
		Mason	Machine	Larvicide	
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Major Works including $\frac{1}{3}$ cost of store labour ..	72,996 92	11,894 23	..	..	84,891 15
<i>Maintenance</i>					
Patrol Works, grass cutting, including drains including tide-gate labour, hire and benzine	503,499 23	..	3,123 58	..	506,622 81
Larvicidal works, trappers, oil checkers and $\frac{1}{3}$ store labour	116,741 64	..	..	46,158 41	162,900 05
Repairs including $\frac{1}{3}$ cost of store labour	60,429 08	15,030 99	..	..	75,460 07
Cleansing of drains by contract labour	50,040 00	..	..	..	50,040 00
	803,706 87	26,925 22	3,123 58	46,158 41	879,914 08
Cost of Haulage ..					19,021 14
					898,935 22

TABLE 31
PERMANENT ANTI-MALARIAL WORKS CARRIED OUT IN THE CITY AREA DURING 1961

Area No.	Name of A.M. Area	INVERTS						SLABS S/PIPES			Labour Cost	Material Cost	Remarks
		21"		18"	12"	9"	18"	8"		6"			
		new	old	new	new	new		new	old	new			
144	Hindoo Cemetery Rav. I ..	..	..	..	20	..	30	..	..	135	\$ 928 65	\$ 146 75	Re-construction of a worn-out drain was completed.
213	Ford Avenue ..	..	..	110	..	10	..	..	..	..	6,074 62	1,077 46	Consolidation of an earth anti-malarial drain with concrete inverts and slabs work completed.
10	Fern Hill ..	6	675	..	..	..	325	..	825	..	18,638 05	1,863 23	Re-construction of a worn-out anti-malarial drain. Work in progress.

CONTROL OF FOOD AND DRUGS

Food and Drugs

The control of the manufacture, storage preparation and sale of food and drugs is exercised under the Food and Drugs Ordinance (Chapter 148) and the Regulations (1957) to the Ordinance. Samples of food and drugs are taken regularly and prosecutions instituted where necessary. The samples are analysed for quality and must comply with standards laid down in the Ordinance. With the integration of the City Health Branch into the Ministry of Health, food sampling continued to be carried out by the City Food and Drugs Section whose staff has been responsible for sampling throughout the island. In 1961, 1,403 samples of food, drugs and other specimens were taken for analysis and other examinations by the Food and Drugs Inspectors in both the City and Rural areas. During the year, 121,848 lb. of unsound food were destroyed as unfit for human consumption. A total of 12,573 premises in the City area and another 10,664 premises in the Rural area were inspected in connection with the preparation, storage manufacture and sale of food. Routine visits were made regularly to all licensed ice cream factories to ensure that health standards were maintained, in accordance with the Food and Drugs Ordinance. During the year, 227 employees of ice cream factories were sent to Middleton Hospital (the infectious disease hospital in Singapore) to check as to whether they are typhoid carriers. This is done every year.

Drugs.—Investigation into the Vitamin A content in multi-vitamin tablets and Cod Liver Oil capsules was carried out during the year. A wide range of content deficiency, sometimes as much as 90 per cent was detected. Importers were warned, and where deficiencies were in excess of 25 per cent, legal proceedings were instituted.

In May 1961, the General Hospital reported a case of chronic arsenic poisoning. The case had been treated by a Chinese physician for asthma. Samples of this drug in pills recovered from the patient were found to contain 212 parts per million of arsenic. On further investigation, it was found that the pills were manufactured by local *sinseh* (medicine man). The arsenic content of a number of samples taken varied from 60–9,000 parts per million. The entire stocks, surrendered by the manufacturer, were destroyed, and the manufacturer was warned.

With these periodic samplings and surprise checks, the improving existing standards of food premises are maintaining a reasonable standard in the quality of both food and drugs available in Singapore.

Markets and Hawkers Section

This Section deals with the licensing and control of the hawkers, the supervision of public markets, licensing and control of private markets and private land used for the accommodation of static hawkers.

Hawkers.—The hawker problem continues to be a controversial one, there being an estimated total of about 40,000 licensed and unlicensed hawkers. Of this number, 4,171 are licensed giving an approximate ratio of 1:10 of licensed to unlicensed hawkers.

Table 32 gives the number of licensed hawkers from 1957–61 for both the City and Rural areas.

TABLE 32

		HAWKERS SECTION				
		Number of Licensed Hawkers				
		1957	1958	1959	1960	1961
Itinerant	...	3,467	1,759	864	617	345
Day Street Pitches						
— City Area	...	2,105	2,229	2,166	3,065	2,586
Day Street Pitches						
— Rural Area	...	—	—	—	—	271
Night Street Pitches		1,153	1,193	1,064	1,198	969
		<u>6,725</u>	<u>5,181</u>	<u>4,094</u>	<u>4,880</u>	<u>4,171</u>

The problem posed by these unlicensed hawkers is partly a health one, in that these hawkers operate in unsanitary circumstances, and to a large extent are completely oblivious of elementary standards of hygiene.

Markets.—There are 29 markets in the City area, and 6 markets in the Rural area. During the year, no new markets were opened, but improvements were made to existing markets, and 4,384 licences were issued for market stalls in the City area and a further 614 for market stalls in the Rural area.

Abattoirs

This Section is responsible for the supply of meat fit for consumption by the public. All animals slaughtered are examined by Public Health Inspectors and released for sale in markets if fit for human consumption. There are 3 abattoirs in Singapore, all situated within the city limits. Two of these are at Jalan Besar, one for the slaughter of sheep and goats, and the other for the slaughter of cattle and buffaloes; while the third abattoir is at French Road and is used solely for the slaughter of swine. The total number of animals slaughtered for 1961 was 550,925, comprising:

452,093 swine.	88,451 sheep.
5,985 oxen.	1,897 goats.
2,479 buffaloes.	50 horses.

The majority of the oxen and buffaloes were imported from Indonesia. The remainder were local animals. All sheep came from Australia, while the goats were of local origin. A total of 185 carcasses were totally condemned as unfit for human consumption.

Plans are being formulated to integrate the abattoirs within the Ministry of National Development under the Primary Production Division.

Chapter Six

THE QUARANTINE AND EPIDEMIOLOGICAL SERVICES

The Quarantine Service is comprised of three closely related Sections:

- (1) the Marine Port Health Service,
- (2) the Air Port Health Service,
- (3) the Quarantine Station.

These three Sections work in liaison with each other so that Singapore is kept free from the introduction of dangerous infectious diseases from infected territories. Singapore, in spite of its proximity to infected countries, did not witness any quarantinable disease for the year, and this is due to the unrelenting vigilance maintained by the Quarantine Service.

The Marine Port Health Service

One of the main innovations for the year was a round-the-clock health clearance commenced on 1st June, 1961. This 24-hour service has been a boon to the shipping community, but it poses the problem of whether medical examinations conducted on smaller freighters are adequate in view of the fact that lighting provided on these freighters is often poor. Difficulties are also experienced in the location and identification of vessels in the dark which results in undue waste of time and delay in clearance.

A new launch is also being built for this Section and it is expected to be put into service in April 1962. This will relieve the extremely heavy pressure on the fleet of the Master Attendant's Department.

The outbreak of cholera during the year in the neighbouring territories of Sarawak, North Borneo, Hong Kong, Macao, China, Philippines, Indonesia and India alerted the Section considerably and increased vigilance was maintained. In the Anti-Cholera Inoculation Campaign implemented by the Ministry on 11th September, 1961, 1,810 persons were inoculated at the Port Health Office and another 8,225 persons were inoculated at the Government Vaccination Centre at North Canal Road. Surface vessels arriving from these infected areas were subjected to a thorough scrutiny and passengers without requisite Health Certificates were put under surveillance.

Health clearance of small craft plying between Singapore and the neighbouring islands is carried out by two Public Health inspectors who rotate duties at the Immigration South Quay Depot.

The Section dealt with the following:

	<i>No. of Vessels</i>	<i>Passengers and Crews</i>
Foreign-going vessels	1,524	35,573
Small craft	10,141	69,293

The Air Port Health Service

The International Airport at Paya Lebar is designated a Sanitary Airport under the terms of Article 19 of the International Sanitary Regulations. During the year, 13 Airlines availed themselves of the facilities provided at the Airport.

The volume of traffic and the number of passengers handled by the Airport Health Office over the last five years is given in the table below:

TABLE 33

	1957	1958	1959	1960	1961
Aircraft from infected Ports	1707	2438	2188	1325	1641
Passengers and crew cleared	82166	94718	94874	74916	91343
Passengers isolated	—	—	—	—	—
Passengers under surveillance	2565	2882	254	174	354

The main reason for the increase in aircrafts and passengers examined during 1961 as compared with 1960, was because of the declaration of Kuching, Hong Kong, Manila as being infected for cholera in July, August and October respectively.

The following table is a summary of work done at the Air Port Health Office for 1961:

TABLE 34

Number of Aircrafts cleared from infected ports	...	...	1,641
Number of Landing Passengers from infected ports	...	...	59,817
Number of Transit Passengers from infected ports	...	...	18,322
Number of Crew	...	...	13,204
Number of Passengers placed under surveillance	...	...	354
Passengers and crew cleared	82166	94718	94874 74916 91343	
Number of Vaccinations against Small-pox done for passengers and Airport personnel	574
Number of International Small-pox Vaccination Certificates issued				145
Number of inoculations against cholera done for passengers and Airport personnel	1,173
Number of International Cholera Inoculation Certificates issued				358
Number of Permits for import, export or Tranship a coffin containing a corpse	16

The general sanitation of the Airport proper and the surrounding area was maintained at a satisfactory level, except for a brief period from 31st October–24th November during the daily-rated workers strike. In the early part of the strike period, refuse disposal was not effectively maintained resulting in fly-breeding which proved to be a nuisance. The situation, however, was quickly brought under control and the nuisance abated.

The control of mosquitoes in the Airport comprising a perimeter of 800 metres was also maintained by a skeleton staff. The total number of *aedes* *Egypti* collections during the year was nil. The *Aedes Stegomyia* for the year was as follows:

1st Quarter	...	...	1.38 per cent
2nd Quarter	...	...	1.15 per cent
3rd Quarter	...	...	1.25 per cent
4th Quarter	...	...	2.19 per cent

The marked rise in this index for the fourth quarter could have been due to the storage of water during the water rationing period and the small degree of emergency services provided during the strike period.

Quarantine Station

With stricter immigration control being enforced, there continues to be a marked drop in the number of passengers quarantined at the Quarantine Station at St. John's Island. 10,615 disembarking deck passengers from infected ports were sent to the Quarantine Station and kept under observation for 48 hours.

Below is a table giving the numbers of passengers quarantined at St. John's Island for the past 5 years:

TABLE 35

<i>Year</i>	<i>Total</i>	<i>Chinese</i>	<i>Indians</i>	<i>Malaysians</i>	<i>Others</i>
1957	24,175	14,965	9,015	140	55
1958	14,421	7,648	6,429	323	21
1959	12,479	5,735	5,912	806	26
1960	10,252	6,201	4,016	15	20
1961	10,615	5,496	4,754	302	63

THE EPIDEMIOLOGICAL SERVICES

This Section which has been newly created will start operating officially in 1962. Among the many new development and re-organisation proposals, the post of a Senior Registrar has been allocated to this section. The duties of this officer will be to co-ordinate all data of an epidemiological nature. This will include analyses, reports, and recommendations to increase the efficiency of the Branch. This officer will also liaise with the Central Immunisation Registry which is planned to be at the Institute of Health, and which will make available to this Section epidemiological information in relation to immunisation programmes related to Maternal and Child Health and School Health Branches. It is hoped that in 1962, the question of infectious disease control which logically should be under this section will be looked into and a more uniform system be brought into action, co-ordinating Middleton Hospital, the School Health and Maternal and Child Health Services and the Epidemiological Section.

Chapter Seven

THE PERSONAL HEALTH SERVICES

UNDER these services are included the Maternal and Child Health Services and the School Health Services.

THE MATERNAL AND CHILD HEALTH SERVICES

General

Maternal and Child Health services were started in the Municipality of Singapore in 1924, and in 1927 these services were introduced into the Rural area. Up to 1960, these services were carried on by the City Health Department and the Government Health Department in the City and the Rural areas respectively. With integration, these services have been unified and are now administered centrally. Financial integration was effected in 1961, and unified administration is evidenced by the fact that there is uniformity whenever it is possible to make it so.

The service operates a network of 27 main clinics, 22 visiting centres and 8 kampong midwife centres. The Maternal and Child Health Branch is administered from the Institute of Health. The main function of the service is preventive, but the curative side has had to be included to meet the exigencies of the health services. In addition to the routine work of these clinics, the M. & C. H. doctors assist with training programmes. This includes lectures to Midwives, Health Visitors and Public Health Inspectors-in-Training.

Below is a list of the clinics and centres as on 31st December, 1961: —

Maternal and Child Health Centres as on 31st December, 1961

<i>Main Clinics</i>	<i>Midwife Centres</i>	<i>Visiting Centres</i>
<i>Rural</i>	<i>(Residential)</i>	
Bouna Vista	Bulim	Princess Elizabeth Estate
Holland Road	St. John's Island	Tanjong Murai
Bukit Timah	Sungei Tengah	Kampong Blukang
Jurong 12½ m.s.	Kuala Loyang	Kampong Bajau
Jurong 18 m.s.	Somapah	Damar Laut
Bukit Panjang	Jurong 10 m.s.	Pulau Sudong
Ama Keng	Lim Chu Kang 18 m.s.	Pulau Semakau
Mandai	Pulau Ubin	Pulau Seking
Thomson Road		Pulau Seraya
Yio Chu Kang		Pulau Bukom Kechil
Lim Ah Pin		Lazarus Island
Kim Chuan Road		Pulau Ayer Merbau
Kampong Batak		Pulau Samulun
Bedok 9 m.s.		Pulau Ayer Merlimau
Ulu Bedok		Chia Keng Village
Changi		Ayer Gemuroh
Sembawang		Pulau Ubin
Keh Hai Road		Ponggol
Pulau Brani		Kampong Loyang
Pulau Tekong		Pulau Sebarok
		Woodlands 15 m.s.
<i>City</i>		Radin Mas
Alexandra		
Aljunied Road		
Institute of Health		
Kim Keat Road		
Kreta Ayer		
Joo Chiat Road		
Prinsep Street		

The Service also tends to the needs of the child and mother population of the islands off Singapore. This service is performed by a health team comprised of a Health Officer, a Health Nurse and a Hospital Assistant. The team travels by motor launch and these islands are visited at least weekly or bi-weekly.

No new clinics were opened up during the year, but a visiting centre was started at Radin Mas in September.

The Maternity Services

These include: (a) ante-natal care; (b) natal care; (c) post-natal care. In addition, the Family Planning Association holds regular sessions at the main Maternal and Child Health clinics.

Ante-Natal Care. An increasing number of mothers requiring ante-natal care attended the centres. The increase was in the region of 6,446 visits. There is no doubt that the increased attendances are to a large extent due to increased health consciousness of the general public and to the fact that the Kandang Kerbau Maternity Hospital has been trying to decentralise its ante-natal work and divert mothers to the Maternal and Child Health clinics. Ante-natal work, with the increased load, has naturally tended to become routine.

Basic care includes:

- (1) full obstetrical history;
- (2) complete physical examination;
- (3) laboratory investigations: haemoglobin, serological tests for syphilis, stool examination for ova, urine for albumin and sugar, blood pressure readings (done at every visit).

Patients showing any abnormality are referred to Kandang Kerbau Hospital. Special emphasis has been on health education during the ante-natal session; and the Branch has been assisted in this by the Health Education Section.

Natal Care. This is essentially provided for in the Domiciliary Midwifery Service. Midwives employed by the Government are resident at the main clinics and at the midwife centres. There is a 24-hour service available for patients who have been attending the clinic and who are found to be suitable for domiciliary delivery. Despite the availability of the service of the midwife, there has been a definite preference for institutional delivery, specially in the City area. In the Rural area, one of the problems to be contended with has been and still is that of the baby being born before the arrival of the birth attendant. This practice has to be overcome with patience and education.

Post-Natal Care. This is achieved by:

- (1) the Domiciliary After-Care Service;
- (2) follow-up of new delivery by District Sister;
- (3) post-natal visits to the clinics.

The Domiciliary After-Care Service started on 1st April, 1960 continues to expand. The service caters for mothers who are delivered at Kandang

Kerbau Maternity Hospital and then return home within 24 hours. This includes both the City and Rural areas.

A separate service now operates at Bukit Timah, Bukit Panjang, Kim Chuan and Jalan Eunos clinics where midwives are solely concerned with puerperal care. The mother and child receive daily attention until the cord drops off.

Follow-up service by District Health Sisters. Every registered new birth is visited by the District Health Sister. This includes mothers and infants who are delivered by private midwives. Where these cases are found to be ill in the puerperium, they are referred to the Health Officer in-charge of the district who then attends to them, if a private practitioner is not in attendance.

Supervision of Midwives. Midwives practising in Singapore are under the supervision of two Supervisors of Midwives — a Rural Supervisor and a City Supervisor. The Rural Supervisor is responsible for all Government midwives in the Rural area and pupil midwives undergoing their domiciliary training, while the City Supervisor supervises the City midwives and the 367 midwives in private practice. This number excludes trained Nurse Midwives. There is a total of 458 midwives in Singapore, 118 being in Government Service and the rest in practice.

To meet a long awaited need, refresher courses were started for practising midwives. Two such courses were held at Kandang Kerbau during the year, and a total of 8 midwives in service attended these two courses (6 from the Rural area and 2 from the City).

Tables 36 and 37 give statistics related to the Maternity Services.

The Child Health Services

The services provided for the child are:

- (i) a comprehensive immunisation programme;
- (ii) advice and health education to mothers on child care, in particular the infant;
- (iii) treatment of minor ailments.

(i) *The Immunisation Programme.* This includes: B.C.G. vaccination, vaccination against smallpox, immunisation against diphtheria, whooping cough and pertussis.

B.C.G. Vaccination. This is on a voluntary basis, but coverage is good as B.C.G. vaccination is not solely a Maternal and Child Health function. It is tied up with a long term anti-tuberculosis programme planned by the Assistant Director of Medical Services (Tuberculosis). During the year, the Maternal and Child Health clinics vaccinated 11,459 infants with B.C.G.

Smallpox vaccination is compulsory. Under the Quarantine and Prevention of Diseases Ordinance, Chapter 147, all children must be vaccinated by the age of 6 months. A total of 45,485 children are reported to have been vaccinated at clinics, police stations and the kampongs.

TABLE 36

	1959			1960			1961		
	Rural	City	Total	Rural	City	Total	Rural	City	Total
Ante-natal visits to clinics ..	75,558	25,553	101,111	105,907	27,660	133,567	108,067	31,946	140,013
Post-natal visits to clinics ..	2,697	..	2,697	4,491	..	4,491	4,516	58	4,574
Confinements attended to by Govt. Midwives	7,201	1,371	8,578	6,640	1,137	7,777	6,491	1,081	7,572
Mothers in labour sent to K.K.M.H.* ..	661	35	646	530	32	562	812	29	841
Visits by Midwives in the Puerperium† ..	45,883	47,113	92,996	62,953	49,006	111,959	86,781	66,948	153,729

TABLE 37

	1959		1960		1961	
	Total	1959 Total	Total	1960 Total	Total	1961 Total
Total Number of Live Births	62,464	..	61,775	..	59,930
Total Number of Still Births	862	..	886	..	763
Confinements in K.K.M.H.	N.A.	..	36,267	..	36,590
Confinements attended to by Government Midwives	8,578	..	7,777	..	7,572
Confinements attended to by Pupil Midwives Class B†	16,031	..	13,504	..	13,001
Confinements attended to by Private Doctors	2,986	..	3,264	..	2,959
Self-attended cases	143	..	114	..	52

* Kandang Kerbau Maternity Hospital
† These include visits for cases in both the Domiciliary Services and the Domiciliary After-Care Service
‡ There are 3 classes of Midwives:
Class A — qualified Nurse Midwife
Class B — qualified Midwife
Class C — Unqualified Midwife (now almost non-existent)

Diphtheria Immunisation. This is given either alone or in combination with other immunizing agents, giving protection against diphtheria, tetanus and whooping cough. More and more of the combined antigen is being used. Immunisation is carried out at all clinics, and by special teams which go out to the kampongs. A total of 33,294 children completed their primary immunisation with triple antigen. This figure is reported to constitute 78.9 per cent of children who originally had their first dose.

Plans are being formulated to introduce legislation making diphtheria immunisation compulsory in 1962. This has been thought necessary in view of the rising incidence of diphtheria, despite the fact that immunisation has been available at Maternal and Child Health clinics for the past 14 years on a voluntary basis.

Polio Immunisation. The Ministry also hopes to implement a programme to immunise children under the age of 6 against poliomyelitis. This will take place in 1962.

(ii) *Advice and Health Education on Child Care.* Attendances during 1961 at Maternal and Child Health clinics showed an overall increase as compared with 1960. There was a drop in infant attendances. This drop was in the region of 10,278, but there was an increase of 44,548 attendances of toddlers and pre-school children.

The staff made use of every opportunity to give advice and Health Education. Children who attend the clinics are both sick and well children, as it has not been possible to separate the service in the face of the ever increasing health needs of this particular section of the population.

Advice given revolves mainly around the infant. The service also distributes powdered milk, multivitamins, commercial protein foods and other additional nutrients to less fortunate families.

Besides the clinic work, visits are made to homes of patients. Health Visiting has suffered greatly in recent years due to staff shortage and the ever increasing load of work. During the year, part of Anti-Cholera Campaign was carried on at Maternal and Child Health clinics and 100,138 children and mothers were inoculated at these centres. Health Visitors were needed in the clinics to cope with this emergency campaign, resulting in a temporary suspension of home visiting. This occurred again during the Bukit Ho Swee fire in May, 1961, when relief centres utilised Maternal and Child Health staff for a 24-hour service. This was repeated on a smaller scale during the Tai Seng fire in August.

(iii) *Treatment of Minor Ailments.* Treatment of minor ailments has become an accepted part of the functions of the Maternal and Child Health clinics, and sick children constitute at least 50 per cent total daily attendances.

Table 38 gives statistics related to the Child Health Services.

Tables 39 and 40 give vital statistics for the Rural and City areas.

Table 38 shows attendances, the number of children immunised and other functions carried out at the Maternal and Child Health clinics for 1959, 1960 and 1961.

SINGAPORE

	1959			1960			1961		
	Rural	City	Total	Rural	City	Total	Rural	City	Total
Infant attendances ..	128,205	231,993	360,198	155,450	250,550	406,000	155,942	239,780	395,722
Toddler and pre-school attendances ..	87,272	77,427	164,699	129,061	97,939	227,000	144,688	126,860	271,548
BCG attendances ..	4,078	5,939	10,017	5,401	6,192	11,593	5,039	6,420	11,459
Primary Vaccination attendances ..	15,183	29,090	44,173	20,997	28,204	49,201	18,397	27,088	45,485
Diphtheria Immunisation:—									
1st dose ..	1,704	16,005	17,709	3,044	5,813	8,857	1,774	3,756	5,530
2nd dose ..	1,245	13,995	15,240	2,654	6,254	8,908	1,526	2,627	4,153
Boosters ..	4,893	2,412	7,305	5,072	6,366	11,438	2,806	675	3,481
Kampong Diphtheria Immunisation:—									
1st dose ..	1,690	..	1,690	1,517	..	1,517	343	..	343
2nd dose ..	1,248	..	1,248	1,182	..	1,182	211	..	211
Boosters ..	1,141	..	1,141	1,097	..	1,097	415	..	415
Triple Antigen Immunisation (Clinic):—									
1st dose ..	21,307	5,054	26,361	18,126	20,163	38,289	18,607	22,982	41,589
2nd dose ..	16,784	3,905	20,689	16,459	16,757	33,216	16,357	19,356	35,713
3rd dose ..	13,349	3,070	16,419	15,505	13,919	29,424	14,692	18,335	33,027
Boosters ..	7,173	..	7,173	10,453	..	10,453	10,738	4,920	15,658
Kampong Triple Antigen Immunisation:—									
1st dose ..	..	..	..	798	..	798	569	..	569
2nd dose ..	..	..	..	513	..	513	364	..	364
3rd dose ..	..	..	..	258	..	258	267	..	267
Boosters ..	..	..	..	612	..	612	657	..	657
Free Milk Distribution:—									
1. Milk to A.N. mothers (No. of mothers) ..	20,800	490	21,290	16,336	555	16,891	8,217	1,529	9,746
2. Milk to children (No. of children) ..	31,513	11,127	42,640	27,159	13,686	40,845	33,873	17,015	50,888
3. Total amount of powdered milk (lbs.) ..	49,699	48,252	97,951	43,372	53,178	96,550	42,090	55,910	98,000
Skimmed Milk:—									
Mothers ..	..	..	..	..	..	..	12,872	5,063	17,935
Children ..	..	..	..	..	..	..	2,127	442	2,569
Total No. of lbs. ..	..	..	..	..	..	..	15,171	9,000	24,171

TABLE 39

VITAL STATISTICS — RURAL AREA

				1959	1960	1961
				<i>Number</i>		
Live-births	...	...	...	26,343	26,029	25,578
Still-births	...	...	...	369	368	346
Total births	...	...	...	26,712	26,397	25,924
Maternal deaths	...	...	...	21	12	12
Perinatal deaths (deaths under 7 days of age and still-births)	...	...	...	688	716	665
Neonatal deaths (deaths under 4 weeks of age)	...	...	...	447	452	427
Infant deaths (deaths under 1 year of age)	...	...	...	968	966	823
				<i>Rate</i>		
Still-birth rate (number of still-births per thousand live and still-births)	...	...	...	13.81	13.94	13.35
Maternal mortality rate (number of maternal deaths per thousand live and still-births)	...	...	...	0.79	0.45	0.46
Perinatal mortality rate (number of deaths under 7 days of age and still-births per thousand live and still-births)	...	...	...	25.76	27.12	25.65
Neonatal mortality rate (number of deaths under 4 weeks of age per thousand live births)	...	...	...	16.97	17.37	16.69
Infant mortality rate (number of deaths under 1 year of age per thousand live-births)	...	...	...	36.75	37.11	32.18

Note:—Figures for the years 1960 and 1961 exclude events occurring among non-locally domiciled services personnel (including United Kingdom-based civilians employed by the Services) and their families.

TABLE 40

VITAL STATISTICS — CITY AREA

				1959	1960	1961
				<i>Number</i>		
Live-births	...	...	...	36,121	35,646	34,363
Still-births	...	...	...	493	368	346
Total births	...	...	...	36,614	36,014	34,709
Maternal deaths	...	...	...	24	16	12
Perinatal deaths (deaths under 7 years of age and still-births)	...	...	...	978	1,031	928
Neonatal deaths (deaths under 4 weeks of age)	...	...	...	633	641	632
Infant deaths (deaths under 1 year of age)	...	...	...	1,281	1,192	1,114

TABLE 40—*continued*.

VITAL STATISTICS — CITY AREA

	1959	1960	1961
		<i>Rate</i>	
Still-birth rate (number of still-births per thousand live and still-births) ...	13.65	10.32	10.07
Maternal mortality rate (under of maternal deaths per thousand live and still-births)	0.57	0.33	0.34
Perinatal mortality rate (number of deaths under 7 days of age and still-births per thousand live and still-births) ...	24.01	28.63	26.53
Neonatal mortality rate (number of deaths under 4 weeks of age per thousand live-births) ...	17.52	17.98	18.40
Infant mortality rate (number of deaths under 1 year of age per thousand live-births) ...	35.46	31.12	32.43

Note:—Figures for the years 1960 and 1961 exclude events occurring among non-locally domiciled services personnel (including United Kingdom-based civilians employed by the Services) and their families.

THE SCHOOL HEALTH SERVICES

General

The School Health Service is centrally administered in Singapore. During the year 14 new schools were opened. At the end of 1961 there were 776 schools in the State, not including the miscellaneous schools (i.e. religious, commercial, sewing, dancing, etc.).

In addition to the 14 new schools, many of the existing schools carried out additions and alterations to enlarge their premises to make accommodation available for more pupils. There were approximately 50,168 new entrants, most of whom were admitted into the first year of the primary school course. The total school population rose from 353,408 in 1960 to 379,602 by the end of 1961, an increase of 26,194.

A classification of Government, Government-aided and private schools together with the enrolment for 1960 and 1961 is shown in Table 41.

TABLE 41

SUMMARY OF SCHOOLS AND SCHOOL POPULATION

<i>Government Schools</i>				
<i>Type of Schools</i>	<i>No. of Schools</i>		<i>Enrolment</i>	
	1960	1961	1960	1961
(a) English	251	259	137,837	145,742
(b) Malay	77	79	19,644	22,201
(c) Chinese	18	21	9,518	11,551
(d) Indian	2	2	148	132
(e) Integrated	—	14	—	7,284
<i>Aided Schools</i>				
(a) English	69	69	36,983	40,964
(b) Malay	—	—	—	—
(c) Chinese	234	236	134,951	138,472
(d) Indian	15	15	1,190	1,287
<i>Private Schools</i>				
(a) English	58	48	8,072	7,120
(b) Chinese	38	33	5,065	4,849
Total	762	776	353,408	379,602

49.23 per cent of all the pupil attended Government Schools.

47.61 per cent of all the pupils attended Aided Schools.

3.16 per cent of all the pupils attended Unaided Schools.

The geographical distribution of schools and the enrolment of Government and Government-aided schools as compared with private schools are shown in Tables 42 and 43.

TABLE 42

GEOGRAPHICAL DISTRIBUTION OF SCHOOLS

	<i>City</i>	<i>Rural</i>	<i>Inland</i>
Government and Government Aided Schools	393	279	23
Private Schools	65	16	—

TABLE 43

DISTRIBUTION OF SCHOOL POPULATION

<i>Government and Government Aided Schools</i>	<i>Private Schools</i>	<i>Total</i>
367,633	11,969	379,602

The School Health Section functions at the Institute of Health, Outram Road, and is responsible for the prevention of disease and the promotion and maintenance of health among the school children and it provides the following services:

- (1) routine and special examination of school children;
- (2) treatment of minor ailments and nutritional defects;
- (3) reference of cases to Specialists in the various Institutions for investigations, treatment or advice.
- (4) control of tuberculosis in school population including teachers, hawkers and other staff;
- (5) control of other infectious diseases;
- (6) sanitary inspection of school premises.
- (7) ensuring the compliance with the provisions of the Education Ordinance (1957) and the Regulations made thereunder.

It also advises on plans for school buildings and assists in the Health Education Programme of the Department.

General Health. On the whole, the general standard of health of the new entrants is fair, and that of the school leavers good.

Of the total number of school children examined by the School Health Officers, 71.19 per cent of the boys examined were rated as being of good general condition, 27.9 per cent fair, 0.91 per cent poor. The corresponding figures for girls were 38.88 per cent good, 53.0 per cent fair, and 8.04 per cent poor.

On the 1st December, 1961, an Almoner was appointed to the School Health Section to fill a very long felt need in the Department.

Routine Medical Examination

Due to the lack of medical staff, the routine medical examination of children was confined to Government and Government-aided schools only. Whilst no examinations are conducted at non-aided (private) schools, children from such schools may, and do, attend the school clinics which are open to all school children.

Because of the enormous size of the school population, it has been found necessary to establish a system of selective examinations. The School Health Officers confine their attention to particular groups. The groups include:

- (a) new entrants;
- (b) primary and secondary school leavers;
- (c) defectives found at previous examinations;
- (d) others, referred by the principals or teachers because their physical or mental progress was considered to be below par.

Table 44 shows the number of medical examinations by sex of the respective groups.

TABLE 44
CLASSIFICATION OF EXAMINATIONS DONE

	<i>Girls</i>	<i>Boys</i>	<i>Total</i>
New Entrants	18,500	20,360	38,860
School Leavers	14,002	16,956	30,958
Re-examinations	13,821	4,577	18,398
Others	2,384	2,802	5,186
Total	48,707	44,695	93,402

Out of a total of 695 Government and Government-aided schools, 560 were visited by a Health Officer or a Lady Health Officer, and in the case of a mixed school by both a Health Officer and a Lady Health Officer. A total number of 93,402 children were examined as against 109,214 for 1960.

Table 45 shows the number of boys and girls examined at the various types of schools.

TABLE 45
CLASSIFICATION OF CHILDREN EXAMINED

<i>Schools</i>	<i>Girls</i>	<i>Boys</i>	<i>Total</i>
Government English	20,008	21,923	41,931
Aided English	5,943	5,323	11,266
Government Chinese	814	547	1,361
Aided Chinese	18,047	14,178	32,225
Malay	3,544	2,620	6,164
Indian	351	104	455
Total	48,707	44,695	93,402

TABLE 46
CLASSIFICATION OF SCHOOLS INSPECTED BY SCHOOL HEALTH OFFICERS

<i>Schools</i>	<i>City</i>	<i>Rural</i>	<i>Island</i>	<i>Total</i>
Government English	143	74	—	217
Aided English	33	21	—	54
Government Chinese	11	3	—	14
Aided Chinese	81	127	—	208
Government Malay	17	35	—	52
Government Tamil	2	—	—	2
Aided Tamil	6	7	—	13
Total	293	267	—	560

The decrease in the number of school children examined for the year is due mainly to the fact that all medical and nursing staff were mobilised to launch the Anti-Cholera Inoculation Campaign against the threat of a cholera epidemic from the neighbouring countries during which period all routine medical examination of school children was suspended. The campaign which commenced on 11th September, 1961 was completed on 31st October, 1961. Eight teams were organised and covered practically all the schools in the State and inoculated some 350,000 school children, school staff and their families.

Treatment of Minor Ailments

Apart from dental caries and defective vision, a much higher percentage of defectives was found among the new entrants. The main defects among school children are skin and respiratory infections followed by sub-nutritional deficiency states — the contributory factors being helminthic infestation, poor dental and personal hygiene, and ignorance of parents of their children's dietetic requirements.

TABLE 47

INCIDENCE OF DEFECTS DETECTED IN ROUTINE SCHOOL MEDICAL EXAMINATION

<i>Defects</i>				<i>Girls</i>	<i>Boys</i>
				<i>Percentage</i>	<i>Percentage</i>
Dental caries	...	...	...	44.41	47.38
Skin conditions	...	...	...	9.97	3.33
<i>Eye:</i>					
Infections	...	...	...	0.51	0.49
Defective vision	...	...	...	7.33	5.52
<i>E.N.T.:</i>					
Enlarged tonsils	...	...	...	0.07	0.43
Ear infections	...	...	...	0.14	0.28
Cardiac disorders	...	...	...	0.44	0.24
Respiratory infections	...	...	...	2.20	0.75
Pulmonary tuberculosis	...	...	...	0.06	0.01
Genito-urinary conditions	...	...	...	0.38	2.05
Anaemia under 60% haemoglobin	...	...	...	0.51	0.55
Worm infestation	...	...	...	8.70	3.46
Other abnormalities including postural defects, cleft palate and chest deformities	...	...	...	2.79	0.42

Children examined: Girls 48,707, boys 44,695.

Dental Caries. This is by far the most common defect found among school children and about 45 per cent of them were found to be suffering from caries of varying severity. The present facilities offered by the Government for dental treatment are inadequate. There are only two Government dental clinics, one at the Institute of Health and the other at Tan Tock Seng Hospital. In addition, there are three school mobile dental clinics, and six school dental huts. However, it is the intention of the Government to incorporate dental huts in the new schools that are to be built in the future. Further, the Government has started a scheme to train local girls as Dental Nurses who on completion of their training should be able to augment the staff attached to the School Dental Service. Some 20 girls will go into training at the newly formed Dental Training School, Institute of Health, with effect from January 1962.

Skin Infections. Due to the lower standard of environmental hygiene, skin conditions such as sores, ulcers, impetigo, ringworm, eczema and scabies are more common among children from the Rural area. Phrynoderma, xeroderma and follicular hyperkerotosis are common findings among children suffering from malnutrition and come from very poor homes. Nits and lice are more often found in Malay and Indian children.

Four cases of neuroderma were referred to the Hansen's Clinic and of these, three were admitted into the Trafalgar Home after the diagnosis of leprosy was confirmed.

Eye Conditions. Conjunctivitis, corneal opacities and occasionally trachomas were seen, and where necessary, referred to the ophthalmologist at the General Hospital.

Visual defects were relatively higher in the older children and they were referred to their own Opticians for the supply of spectacles. The poorer children were issued with free spectacles at Government's expense.

Organic Valvular Heart Disease. Mitral stenosis, auricular and ventricular septal defects, patent ductus arteriosus and pulmonary stenosis are the common heart defects found. In the case of the acquired cardiac disabilities they are probably of rheumatic origin although a previous history of rheumatic fever is very difficult to obtain.

These cases are referred to the Cardiac Clinic at the Institute of Health which is held every Tuesday morning under the charge of the Professor of Medicine, University of Singapore.

Blood Conditions. Cases of anæmia, particularly gross anæmia, were found more in the Rural areas where worm infestation is prevalent. A certain number of these cases were due to nutritional causes in both urban and rural areas.

One interesting case was that of a girl who, with a hæmoglobin of 5 per cent, was found to be resistant to two courses of parenteral iron therapy. She was referred to the Pædiatrician and found to be a case of Hæmoglobin H. disease.

Helmenthiasis. A high percentage of children in the urban and rural areas are infested with threadworms and roundworms.

The children in the Rural areas are in addition infested with hook-worm. This is due to the fact that there are less sanitary facilities, the use of night-soil as garden or vegetable manure, and many of the children failing to use protective foot-wear.

Personal Hygiene. Although there is some improvement in the general cleanliness among school children, yet it is felt that more attention should be paid to the care of teeth and finger nails and the wearing of shoes particularly in the rural schools. The school teachers can play an important part by devoting some time for the practical teaching of personal hygiene and for the daily inspection of the pupils.

School Clinics

There is one main clinic at the Institute of Health, Outram Road, and functions daily both in the morning and afternoon. There are also three subsidiary clinics conducted at the General Outpatient Clinic premises in the urban and rural areas. The Paya Lebar Clinic functions on Monday and Friday afternoons, the Kallang Clinic on Friday afternoon and the Bukit Timah Clinic on Saturday mornings. The Health Officers responsible for the schools served by the particular clinic are in attendance at each clinic session to follow up their own cases. Cases requiring special attention are referred to the specialists, hospitals or other institutions.

The subsidiary school clinics remained closed for the period 11th September, 1961 to 31st October, 1961 when the Anti-Cholera Inoculation Campaign in the schools in the State was in progress. This was, as previously mentioned, because all nursing staff of the School Health Service were mobilised to undertake this task. However, the main clinic at the Institute of Health remained open all the time.

Tables 48 and 49 show the attendances at the school clinics for the years 1959 to 1961, and the breakdown of school clinic attendances respectively, while Table 50 shows the cases referred to the specialists, hospitals and other institutions.

TABLE 48
ATTENDANCES AT THE SCHOOL CLINICS

		1959	1960	1961
Total No. of new cases	...	44,730	55,056	52,196
Total No. of re-visits	...	59,004	81,057	74,612
Total	...	<u>103,734</u>	<u>136,113</u>	<u>126,808</u>

TABLE 49
BREAKDOWN OF SCHOOL CLINIC ATTENDANCES, 1961

		New Cases	Repeat Cases	Total
Institute of Health Clinic	...	42,746	67,585	110,331
Paya Lebar Clinic	...	5,099	3,194	8,293
Kallang Clinic	...	3,224	2,777	6,001
Bukit Timah Clinic	...	1,127	1,056	2,183
Total	...	<u>52,196</u>	<u>74,612</u>	<u>126,808</u>

TABLE 50
CASES REFERRED TO SPECIALISTS, HOSPITALS AND OTHER INSTITUTIONS

(a) Cases referred to Specialists				
Cardiac Specialist	...	...	...	134
E.N.T. Specialist	...	...	...	391
Psychologist	...	...	...	25
Pædiatrician	...	...	...	158
Ophthalmic Surgeon	...	...	...	425
Surgeons	...	...	...	1,052
Physicians	...	...	...	144
Orthopædic Surgeon	...	...	...	173
Skin Specialist	...	...	...	52
Gynæcologist	...	...	...	13
(b) Cases referred to Hospitals and other Institutions				
General Hospital for admission	...	...	...	74
Casualty Department, General Hospital	...	...	...	1,090
Physiotherapy Department, General Hospital	...	...	...	4
Middleton Hospital	...	...	...	123
Trafalgar Home	...	...	...	3
Hansen's Clinic	...	...	...	4
Social Hygiene Clinic	...	...	...	5
Cases sent to School T.B. Officer	...	...	...	171
Dental Clinic at Tan Tock Seng Hospital	...	...	...	25
Dental Clinic at Institute of Health	...	...	...	587
X-Ray Department at General Hospital	...	...	...	103
X-Ray Department at Institute of Health	...	...	...	1,539

School Travelling Dispensaries. The two travelling dispensaries in the charge of one Health Sister assisted by three Nurses visited the rural and remote urban schools during the year for the treatment of minor ailments and to follow up cases referred by the School Health Officers.

The School Section took delivery of the third travelling dispensary for which provision was made in the 1961 Estimates some time in April 1961. The travelling dispensary was not put to use due to the shortage of nursing staff. It is hoped to make use of this mobile dispensary in 1962.

TABLE 51
TOTAL NUMBER OF VISITS TO SCHOOLS AND TREATMENT
GIVEN BY THE TRAVELLING DISPENSARIES

	1959	1960	1961
Total No. of visits to schools	879	1,315	909
Total No. of treatment given	56,258	73,017	46,403

Control of Tuberculosis in School. This is effected—

- (1) through the routine school examination. Tuberculosis children are referred to and treated by the School Tuberculosis Officer;
- (2) routine chest X-ray examination of teachers, other school staff and hawkers.

Infectious Diseases. Table 52 shows the number and types of cases reported during the last five years.

TABLE 52
INFECTIOUS DISEASES IN SCHOOLS

	1957	1958	1959	1960	1961
Chickenpox	376	202	202	244	170
Diphtheria	118	124	272	425	335
Mumps	218	207	325	984	447
Dysentery	—	6	16	26	26
Leprosy	4	4	11	6	3
Malaria	—	1	4	1	2
Measles	265	140	19	20	17
Poliomyelitis	1	14	—	2	3
Typhoid fever	4	6	13	6	7
Whooping Cough	28	34	20	83	35

Home and School Visiting. Homes and schools were visited by a team of School Health Nurses. They were responsible for the following:

- (i) to investigate and follow-up cases of tuberculosis;
- (ii) to follow-up cases of infectious diseases reported by the various authorities;
- (iii) to take throat swabs of all indirect contacts of cases of diphtheria reported by the District Health officers. (2,106 throat swabs were taken in 1961 as against 3,451 in 1960);
- (iv) to vaccinate new entrants;
- (v) to carry out the preliminary examination of the school children including the taking and recording of the heights and weights prior to the routine medical examination of these children by the School Health Officers.

Feeding Schemes

There are two types of feeding schemes for school children. Slightly undernourished children are supplied with free skimmed milk made available through the courtesy of the Social Welfare Department on the recommendations of the School Health Officers. This scheme had unfortunately to be discontinued because of the failure on the part of some of the school principals to comply with the directions issued by the Social Welfare Department.

On investigation, the principals complained that the milk was not popular with the children because of the peculiar odour it had and that the principals were not provided with funds to purchase utensils for the preparation of the milk nor to purchase any sugar or flavouring agent to sweeten and flavour the milk, to render it palatable. This was looked into and the Education Ministry has, this year, provided the funds for the principals to purchase utensils, sugar and milk. The skimmed milk now is very popular with the children and 20,936 were recommended for the issue of this milk for the year.

The other scheme is to help those children belonging to the less-provided families. Whilst the scheme caters for school children with any type of pathological condition, in practice it is found that most of those receiving this extra nutrition have some type of tuberculous lesion. A sum of \$22,000 was provided by the Government in the 1961 Estimates to meet the cost of this scheme.

The ration consists of:

- 1 lb. full cream powdered milk
- $\frac{1}{2}$ lb. vitaminised skimmed milk
- $\frac{1}{4}$ lb. ovaltine for flavouring
- $\frac{1}{2}$ lb. fresh butter
- 6 fresh hen eggs
- 6 oranges
- 1 lb. groundnuts.

The above ration is issued fortnightly to the child until such time as his condition shows sufficient improvement. During the year, 5,641 such fortnightly rations were issued to 456 children.

Environmental Hygiene in Schools

Further progress was made in the field of environmental hygiene and sanitation in the Singapore schools during the year 1961.

More than 1,500 health posters on "Anti-Litter" and "Flies Spread Diseases" were distributed to the various schools in Singapore through the Ministry of Education.

A fully qualified Public Health Inspector was transferred to this Branch during May this year, thereby increasing the inspectorate to two. These officers are engaged on a full-time basis for duties connected with the School Health Service. Visits are made regularly to various schools for the purpose of routine inspection or in connection with special investigation. The former

type of visit is carried out yearly for the purpose of ensuring that the provisions of the Education Ordinance and the Regulations made thereunder are complied with while the latter is made when complaints are received, nuisance reported, applications by new schools for registration made and new school projects or any additions or alterations are applied for. During the year, 724 inspections were made by these officers and a total of 825 reports were transmitted to the Ministry of Education, School Principals and other Departments.

An important investigation was conducted during the year on the "experimental classroom" erected at Margaret Drive School, where with a view to effecting saving in building cost, terra cotta blocks were used in place of standard brick walls with conventional windows and vents. Tests were carried out in this room under the guidance of the Department of Physiology, Faculty of Medicine, University of Singapore, and the results revealed that the natural lighting and ventilation were far from satisfactory. This adverse report finally led to the project being abandoned.

Overcrowding. Overcrowding still exists in few of the schools, more particularly in the smaller vernacular schools. Such cases were reported to the Ministry of Education for appropriate action. During the year, 224 Accommodation Certificates were issued.

Sanitation. There is a gradual but steady trend of improvement in the general Sanitation of the schools. Conversion of bucket system of latrines into water-borne type is promptly effected wherever public sewer mains are extended to the schools, and in areas where public sewers are non-existent, installation of septic tanks is adopted whenever the circumstances permit.

Nightsoil removal poses a problem in the remote rural schools. Clearance of nightsoil by private toties is seldom regular and this has often caused nuisance. Bore-hole latrines are recommended, wherever practicable, to overcome this problem.

School Tuckshops. Regular inspections of the school tuckshops were carried out in order to ensure that a reasonable high standard of food hygiene is maintained in these premises. Appreciable improvement in tuckshop arrangements has been observed both in the City and Rural schools.

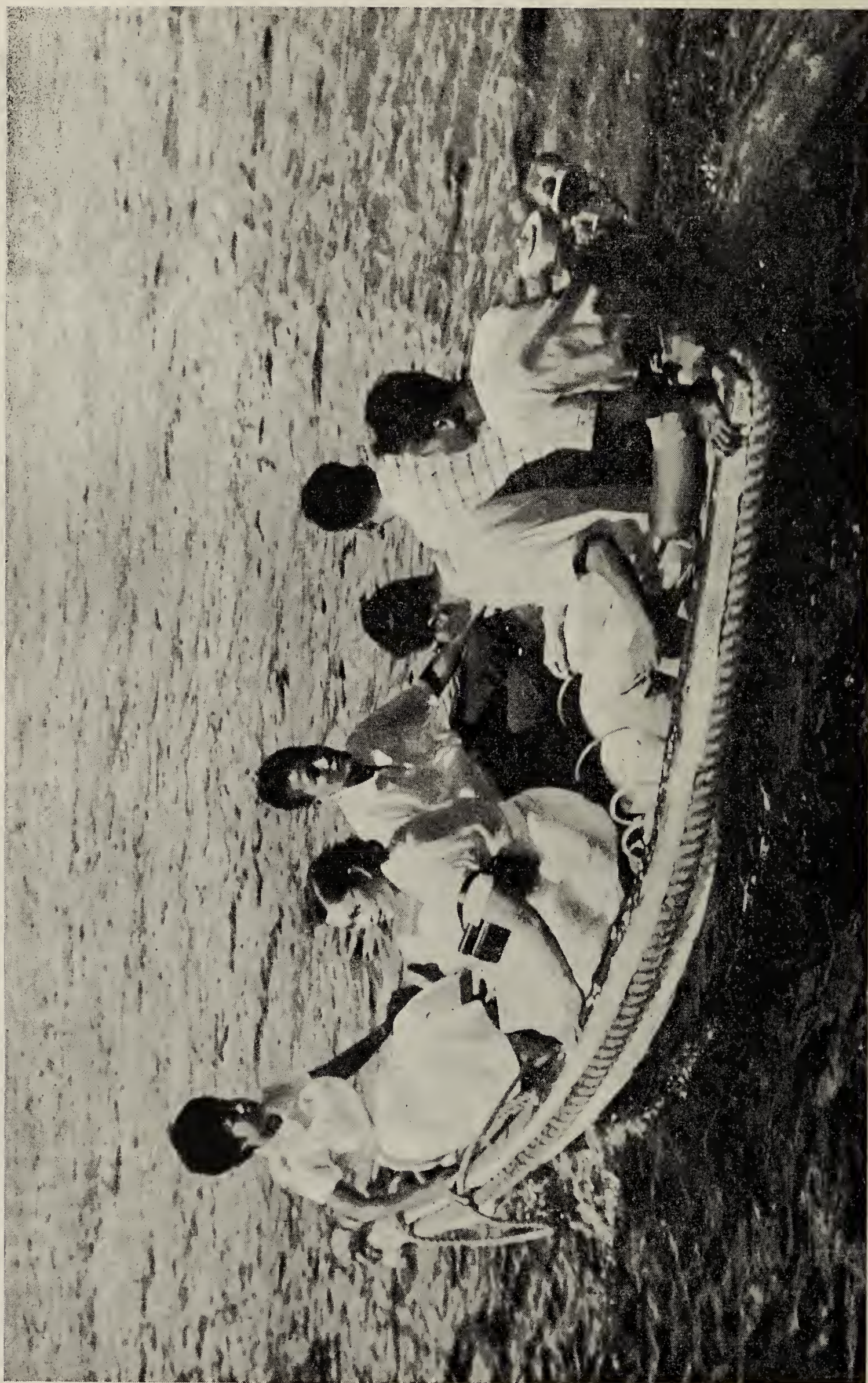
THE ISLANDS IMMUNIZATION TEAM



Immunization Team on their way to the launch



Boarding the launch



The last lap of the journey

ACTIVITIES OF THE HEALTH EDUCATION SECTION



Film Show in a kampong



Teaching mothers at an Ante-Natal Session



Mobile Exhibition on Family Planning at a Community Centre



Health Education and Advice given at Maternal and Child Health Clinics



Health Education and Advice given at Maternal and Child Health Clinics

CHAPTER EIGHT

HEALTH EDUCATION AND TRAINING

HEALTH EDUCATION

The functions of this Section are many and varied. The Section not only plans and conducts courses in Health Education, but is responsible for producing materials as aids to health teaching. During the year, among other activities, this Section helped in health campaigns, put up exhibitions and planned a programme of Health Education for Maternal and Child Health clinic staff at the Institute of Health.

Health Campaigns. The Section assisted the Tuberculosis Control Unit when it carried out its Mass X-Ray campaign at Stamford. Publicity materials were provided and film shows were organised for the campaign.

Exhibitions. The Family Planning exhibition which was held in late 1960 was continued on a smaller scale as a mobile exhibition and was extended to several community centres.

A small display on Overcrowding and Family Planning was held in conjunction with the Housing Board Exhibition from 12th August, 1961 to 20th August, 1961.

Film Shows. The Section arranged for film shows on Family Planning for several groups at community centres. A regular weekly film show was arranged for Health Inspectors to show them that they can play an important and active part in Health Education. Other film shows were held from time to time to demonstrate the usefulness of film as a medium of instruction in Health Education.

Health Education Programme for M. and C. H. Staff. A programme of Health Education lasting 2 months was implemented at the Maternal and Child Health clinic at the Institute of Health. This was directed to expectant mothers.

A programme of talks and film shows was arranged at Kampong Tulloch, Medical Centre, for the wives of Malay Army Personnel.

A survey was carried out to ascertain the views of mothers on giving blood for serological tests at Ante-Natal Sessions.

Special Programme for World Health Day. A short programme was arranged at the Cultural Centre, Fort Canning, to celebrate World Health Day. Representatives from the various Ministries and voluntary organisations in Singapore were present. The theme for the celebration was "Accidents and Accident Prevention". Short talks on the subject were given by Doctors in the Ministry, and this was followed by a panel discussion in which representatives from the public took part. The programme ended with the showing of 2 short films on accidents. The discussion was recorded and broadcast over Radio Singapore.

Health Education Materials. A newsletter containing articles on Health was produced and circulated to schools. 2,000 copies were printed of the first issue.

Posters. 2 posters were produced: (a) "Flies Spread Diseases"; (b) "Use Mc" — a poster on litter and the proper use of dustbins.

Handbills—120,000 handbills of the “Use Me” poster were printed and distributed through the Consolidated Accounts Section of the City Treasurer’s Department.

Flannel Graphs—Two flannel graphs, one on “Home Confinement Needs” and another to explain the need for “Blood Tests” were produced and distributed to the Maternal and Child Health Branch.

Sound Film Strips—Three sound film strips were produced: (a) Falls; (b) Playing with Fire; (c) Clean Food Means Better Health.

Birth Atlas—Sets of a birth atlas were made and distributed to the Maternal and Child Health Branch.

Lectures—The Health Education Officer assisted in the training of Health Inspectors and Health Visitors in the Royal Society of Health courses leading to the Public Health Inspector’s Diploma and for Public Health Nurses’ Diploma. Several lectures, demonstration and field demonstration in clinics were held in conjunction with this training programme. Other teaching sessions were held from time to time for nurses in training.

TRAINING

This Section deals with the organisation training courses for (a) Public Health Inspectors for the Royal Society of Health Diploma; (b) Public Health Nurses leading to the Royal Society’s Diploma for Public Health Nursing; and (c) Assistant Nurses.

It also liaises with other training institutions and plans refresher courses and seminars.

In 1961, 18 Health Inspectors were trained but no course was held for Public Health Nurses. This was planned so as to arrange for the Public Health Nurses’ course to coincide with the University of Singapore’s academic year, as many of the lectures for this course are from the University Staff.

Table 53 shows the summary of schools, school population, children examined and Health Officers, 1956–1961.

TABLE 53

SUMMARY OF SCHOOLS, SCHOOL POPULATION, CHILDREN EXAMINED
AND HEALTH OFFICERS, 1956—1961

	1956	1957	1958	1959	1960	1961
Registered Schools	624	668	702	718	762	776
Students ..	235,079	260,444	295,481	320,977	353,408	379,604
Students examined	69,644	80,991	74,058	124,250	109,214	93,402
Health Officers ..	13	11	13	11	12	11

Chapter Nine

DENTAL SECTION

DURING the year 1961, the Dental Section underwent further expansion in its services and facilities. The total strength of the operating staff of Dental Officers and Dental Nurses comprised of 46 Dental Officers and 9 Dental Nurses. The most notable feature in the physical development of the Service was the construction of the Dental Nurses' Training School to accommodate 40 Dental Nurses in training. In this connection, two Tutor Sisters from New Zealand under the Colombo Plan joined the staff in September to assist in the training of Student Dental Nurses.

The activities of the Section could be grouped under two main categories — clinical and preventive.

CLINICAL DENTISTRY

This division was expanded further by the establishment of two dental huts at Tanjong Katong Girls' School and one School Dental Unit within Labrador School. A definite plan was adopted this year with the agreement of the Ministry of Education in regard to the setting up of dental units in new schools. Plans had been drawn up for the setting up of such dental units at Labrador, Guillemard, Telok Kurau and Kaki Bukit Schools as a start. The plan for a Central School Clinic at Pegu Road to replace the present clinic at Tan Tock Seng Hospital was finalised and the construction of the building scheduled to begin early in the following year.

The schools division comprised of the following clinics:

- 2 large Central School Dental Clinics — One at the Institute of Health, one at the Tan Tock Seng Hospital.
- 7 small school dental clinics — one dental hut each at Rangoon Road School, Anthony Road School, Pearl's Hill School, McNair Road School. Two dental huts at Tanjong Katong Girls' School. One dental clinic at Labrador School.
- 3 Community Centre Dental Clinics — one clinic each at Geylang, Siglap and Buona Vista Community Centres.
- 3 mobile dental clinics.
- 1 dental clinic at Pulau Bukom.

The School Dental Clinic at Tan Tock Seng Hospital functioned efficiently with a staff of five Dental Officers and one Dental Nurse. Dental treatment was given to all school-children referred by their school principals on an emergency basis. Complete and systematic treatment was given to a limited number of school-children from certain primary schools in the neighbourhood. It was intended that this clinic be moved to the proposed new 2-storeyed building at Pegu Road next year.

The School Dental Clinic at the Institute of Health, first opened in May 1959, began to function more fully and extended its services to greater numbers of school-children. The staff consisted of five dental officers and two orthodontists. The demand for treatment at this clinic became so acute that extension works to incorporate an additional surgery of five chairs was commenced. It was expected that this surgery would be used early the following year.

The dental huts staffed by Dental Nurses continued to operate effectively at four primary schools under the supervision of one Dental Officer. The two new dental huts at Tanjong Katong Girls' School began operation in October while the dental unit in Labrador School was opened in November.

Three dental clinics located at Geylang Community Centre, Siglap Community Centre and Buona Vista Community Centre provided treatment to under-privileged children attending various Children's Social Centres in the State. School-children were also treated in these clinics.

Three mobile dental clinics belonging to the Section visited regularly a number of schools in the rural areas and their schedule of routine treatment for school-children had been well maintained. These clinics also provided emergency treatment to various schools which requested urgent dental attention. In addition, these clinics visited several institutions including the Blind School, Children's Red Cross Home, Boys' Town, Cheshire Home and the Salvation Army Nursing at Bukit Timah.

The dental clinic at Pulau Bukom continued to function as a part-time clinic for school-children on that island.

HOSPITALS DIVISION

The dental clinic at General Hospital provided general and specialist dental treatment to out-patients and ward cases of the Hospital. This continued to be the main Government dental clinic for out-patients and treatment for the poorer sections of the population. The teaching staff and students of the Dental School worked in conjunction with Government Dental Officers at this clinic and there was close co-operation in providing a comprehensive range of treatment. During 1961, there was an increase of in-patients' attendance at the clinic and a report of work done is given in a Section on Dental Clinic, General Hospital, in this Chapter.

The chronic sick in Tan Tock Seng Hospital, Trafalgar Home and Woodbridge Hospital were given dental attention by one Dental Officer at dental clinic located in these institutions.

A dental out-patients clinic was being constructed in the compound of the Bukit Panjang Out-patient Clinic. The clinic is expected to open early in 1962.

Inmates of the St. Andrew's Orthopædic Hospital continued to receive dental care from a mobile dental team which visited the Hospital regularly.

MATERNAL AND CHILD HEALTH DIVISION

Pregnant and nursing mothers and their toddlers received dental attention at seven dental clinics located in the following centre:

Bukit Timah M. & C.H.C.

Ama Keng M. & C.H.C.

Mandai M. & C.H.C.

Yio Chu Kang M. & C.H.C.

Jalan Eunos M. & C.H.C.

Prinsep Street M. & C.H.C.

Buona Vista Community Centre.

Two dental huts were constructed to accommodate the dental units at Ama Keng and Yio Chu Kang Centres to provide better working conditions and to increase the intake of patients.

This dental service was closely associated with other medical services provided at Government M. & C.H. Clinics and was intended for promoting the dental health of patients attending these centres.

MISCELLANEOUS DENTAL SERVICES

The Dental Section continued to operate the Police Dental Clinic at the Central Police Station. The Dental Officer treated rank and file of the Force to render these officers dentally fit. This dentist also visited the Changi and Outram Prisons regularly to attend to inmates and detainees.

A Dental Officer visited the Opium Treatment Centre, St. John's Island once every week to treat the inmates.

During 1961, mobile dental teams were sent to various charitable institutions where free dental treatment was needed. As a general rule, only emergency dental treatment was given to the inmates. The Lee Kuo Chuan Nursery, Cheshire Home, Gimson School, Boys' Town, Blind School and Red Cross Home were visited.

PREVENTIVE DENTISTRY

The end of 1961 marked the fourth completed year of fluoridation of the entire Municipal water in Singapore.

Satisfactory progress was achieved in the fluoridation scheme which constituted an important step in the control of dental decay among the young population. The annual dental survey in connection with this scheme was carried out early in the year and its main objective was the assessment of the efficacy of fluoridation in reducing the incidence of dental caries among school-children in Singapore. Results of these annual surveys are promising so far but no significant figures could be expected at the present stage.

TRAINING OF STAFF

Two Dental Nurses, Miss P. Gonzales and Mrs. Lim Loo Cheong, were awarded Departmental Scholarship for Tutor Sister Course in New Zealand. They left for New Zealand on 30th August, 1961.

One Dental Officer, Mr. Lim Kheng Ann completed his higher professional studies in U.K. under a Departmental Fellowship and succeeded in obtaining two higher dental qualifications: F.D.S., R.C.S. (Edin.), M.D.S. (Manchester).

Another Dental Officer, Mr. Tan Yok Lin, now on study leave in U.K. has obtained a higher dental qualification of H.D.D. (Glasgow).

Two Dental Nurses were doing their final year of training at the Penang Training School. They were expected to return early next year. No more Nurses would be sent to Penang in future as Nurses would be trained at the Ministry own Dental Nurses' Training School, which will be ready to open early in 1962. Twenty Student Dental Nurses had already been selected for training in the new Dental Nurses' Training School.

DENTAL BOARD

The Inspecting Officer, Dental Board made a total of 320 inspections on Division II dentists in Singapore.

A total of 56 warning notices were issued to a number of these dentists.

DENTAL SERVICES, SINGAPORE

RETURN OF WORK

Period covered January 1961—December 1961

	PATIENTS SEEN				TREATMENT GIVEN							PATIENTS			
	NEW CASES			Re-examined	Total attendances	FILLINGS			EXTRACTIONS		Scalings (per visit)		Dressing (per visit)	Dentures inserted	Other treatment
	Examined	Requiring treatment	Refusing treatment			Silver Amalgam	Silicate	Other	Deciduous teeth	Permanent teeth					
SCHOOLS DIVISION:—															
School Dental Clinic, T.T.S.H. . .	4,906	4,906	261	812	24,530	10,735	1,145	5	8,685	4,414	1,293	5,569	31	1,598	956
S.D.C., Institute of Health . .	30,835	30,835	..	22	42,127	9,845	956	49	22,504	12,581	840	2,571	318	2,872	1,110
Dental Nurses Clinics . .	904	904	21	4,362	16,673	8,650	1,412	96	4,005	515	4,701	1,926	5	764	2,639
Mobile Dental Clinics . .	1,682	1,638	..	4,270	11,045	4,986	287	205	5,604	1,474	281	2,979	6	77	466
Tanjong Katong Dental Clinic . .	422	415	..	..	1,873	1,370	101	27	719	78	102	314	2	36	103
Geylang Community Centre . .	343	343	504	4,378	5,225	3,100	405	11	2,478	819	257	672	76	611	561
Siglap Community Centre . .	483	469	62	54	4,241	1,479	182	1,069	2,985	805	152	36	29	3	238
Buona Vista Community Centre..	749	749	37	2,197	2,296	362	79	4	1,426	1,373	63	111	138	716	149
HOSPITALS DIVISION:—															
Dental Clinic—General Hospital	39,242	39,242	..	71,445	110,687	6,363	1,980	2,532	46,295	47,690	..	16,787	2,247	3,683	1,409
Dental Officer—Chronic Sick . .	5,077	5,077	34	3,959	5,077	552	163	195	58	4,683	65	125	177	424	..
MATERNITY AND CHILD WELFARE DIVISION															
Bukit Timah and Ama Keng . .	1,965	1,965	..	..	8,871	1,000	196	..	2,889	6,262	194	908	441	1,165	257
Mandai and Yio Chu Kang . .	991	991	30	1,018	5,701	963	218	54	1,952	3,167	225	791	217	314	304
Jalan Eunus . .	1,085	1,085	..	4,876	5,961	615	25	1	1,329	4,098	216	156	341	915	329
Prinsep Street . .	740	740	..	3,662	4,402	814	209	10	83	3,459	150	236	281	659	183
MISCELLANEOUS															
Police Dental Clinic . .	643	643	65	4,380	5,023	1,065	114	..	..	2,670	357	514	157	1,086	285
St. John's Island . .	233	233	..	374	607	4	..	..	85	674	..	4	..	2	20
Pulau Bukom . .	122	122	2	283	527	168	9	..	234	67	17	59	..	49	55
Orthodontic Clinic, Institute of Health . .	1,172	1,172	..	4,553	5,285	84	31	86	317	421	19	133	644	2,080	..
Total . .	91,594	91,529	1,016	110,645	260,781	52,155	7,513	4,344	101,648	95,250	8,932	33,891	5,110	17,054	9,064

DENTAL CLINIC GENERAL HOSPITAL

As Government and University activities are difficult to separate at the Dental Clinic, this report should therefore be read in conjunction with the Annual Report of the University of Singapore.

Staff. There is at present a staff of 12 Dental Officers and Housemen. During the year there has been a number of transfers and the addition of new housemen. Mr. G. Paul, B.D.S., F.D.S.R.C.S. (Ed.) has been promoted to Senior Registrar in Dental Surgery and Mr. Lim Kheng Ann returned from study leave having obtained the M.D.S. (Manchester), F.D.S.R.C.S. (Ed.).

The University establishment at present numbers 12. Mr. Choo Teck Chuan, B.D.S., F.D.S.R.C.S. (Eng. and Ed.) Dip. Orth. R.C.S., joined the staff and Mr. J. A. Jansen, B.D.S., M.S.C.D. was appointed Professor of Prosthetic Dentistry, Mr. R. V. Lam, M.D.S. obtained the degree of M.S.D. from the University of Ohio, U.S.A.

General. The overall picture is set out in Tables 54, 55 and Form MD2. Table 54 gives the detailed figures of the work done in 1961 and Table 55 gives the comparative figures for the last 11 years. For the 3rd successive year the total of out-patient attendances is well over the 100,000 mark and the daily average remains high at approximately 370. Whilst the majority of patients still seek treatment for the relief of pain, there has been a marked increase in the amount of conservative work completed with an approximately 50 per cent increase over the previous year. The larger Government staff have contributed to this increase, since it is now possible to vary their duties and allow them to do more conservative and preventive dentistry.

The demand for certain types of dental treatment is still heavy and this applies particularly to those seeking dentures and to children requiring general anæsthetia for extractions.

It must be again mentioned that the space available for oral surgery, including extractions, is unsatisfactory. Whilst we have been able during the past year to use some chairs in the Conservative Clinic, this will not always be possible and consideration must be given to providing additional facilities in the very near future.

Plans were submitted several years ago for the enlargement of the Dental Clinic and for the required basic equipment. By partitioning the existing students and technicians common room there now exists a small recovery room which has long been considered necessary.

Excellent support and co-operation has been received from the various hospital units, without which our in-patient treatment would not have been possible.

Revenue. Revenue shows an increase of \$4,772.50 from \$25,077.25 to \$29,849.75 for last year.

There has been excellent co-operation between Government and University and it can be said that the Dental Clinic staff working to capacity are responsible for a most satisfactory year's return.

Division I Dentists. During the year 1961 there were 8 new registrations and 4 removals in the List, resulting in an increase of 4 dentists.

The total number of 98 Division I dentists was distributed as follows:

			Beginning of 1961	End of 1961
Private Practice	...	...	38	38
Government Service	...	...	42	46
University of Malaya	...	...	12	12
Armed Services	...	...	2	2
			<hr/> 94	<hr/> 98

A closer study of the list showed that—

- (1) 5 dentists joined Government Service and 1 resigned (left the state);
- (2) 1 dentist on the staff of the University left the state but another joined the staff;
- (3) During the year there were 2 new registrations from members of the armed services but at the end of the year only 2 members renewed the Annual Practising Certificate.

Division II Dentists. During 1961 there were 2 deaths and 1 restoration. At the end of the year 3 dentists were removed from the list because 2 of them expressed their intention to retire and the other failed to renew the Annual Practising Certificate. The number of dentists was therefore reduced from 231 to 227 at the end of 1961.

Inspection. A total of 320 inspections were carried out during the year.

Warning Notices. 56 warning notices were issued:

Covering	...	...	...	...	8
Failure to display Annual Practising Certificate	...	...	...	...	33
Failure to display Name Plate	...	...	...	...	10
Failure to display Annual Practising Certificate and Certificate of Registration	...	...	...	...	2
Failure to display Annual Practising Certificate and Name Plate					3
					<hr/> 56

Change of Address. There were 18 changes of address. Many of these changes were due to poor practices. Where the change has been to premises owned by dental mechanics covering was suspected.

Illegal Practices. There were three premises without registered dentists. The persons in charge of these premises were warned of the consequences of practising illegally and were advised to close the premises or to employ registered dentists. But they have persisted in keeping the premises open for business.

It is advisable that action should be taken against these persons otherwise it will encourage other people to open similar premises.

TABLE 54
DETAILED FIGURES OF THE WORK DONE IN 1961

1961				PATIENTS					EXTRACTIONS								FILLINGS										Oral Sugery Operation	Periodontia	Orthodontia	Dressings	Number of Dentures supplied	X-RAYS			
				FIRST VISITS			Average Daily Out-patient Attendances	Percentage of Government Servants	Repeat Cases	Number of Out-patient Attendances	ADULTS				CHILDREN				ADULTS													Number of Patients	Number of Films		
				Government Servants	Others	Total					Local and Regional Anaesthetic		Other General Anaesthetic		Local and Regional Anaesthetic		Other General Anaesthetic		Total of all Extraction Cases	Amalgam	Synthetic Porcelain	Acrylics	Inlays	Crowns	Bridges	Gold Foil								Root Fillings	Total of all Fillings
											Patients	Teeth	Patients	Teeth	Patients	Teeth	Patients	Teeth																	
	*			†													§										‡	‡	¶						
January	..	..	..	83	2,821	2,904	330.54	2.85	5,029	7,933	2,905	3,880	..	..	998	1,471	384	1,396	4,287	464	153	17	104	13	9	10	44	814	63	151	..	781	164	404	814
February	..	..	..	67	2,354	2,421	325.95	2.76	4,750	7,171	2,316	3,091	2	11	798	1,152	312	1,212	3,428	449	166	35	84	8	3	10	37	792	50	198	13	2,182	129	415	914
March	..	..	..	85	3,163	3,248	368.76	2.62	5,971	9,219	3,048	3,905	..	..	963	1,471	330	1,148	4,341	883	212	25	184	24	2	33	57	1,420	74	277	2	1,069	249	564	1,508
April	..	..	..	74	3,291	3,365	368.35	2.19	5,107	8,472	3,054	3,897	..	..	1,366	2,091	340	1,139	4,760	388	123	11	51	3	2	6	24	613	64	161	28	808	170	353	783
May	..	..	..	70	3,251	3,321	369.92	2.10	5,927	9,248	3,417	4,258	..	..	1,229	1,386	366	1,339	5,012	257	111	7	29	4	1	2	27	438	56	117	..	912	138	379	757
June	..	..	..	71	3,177	3,248	377.96	2.19	6,201	9,449	3,271	4,229	1	3	1,112	1,579	353	1,208	4,737	366	106	3	65	2	..	2	131	675	81	221	8	899	207	506	1,264
July	..	..	..	68	3,220	3,288	376.80	2.16	6,509	9,797	3,525	4,494	..	..	1,113	1,534	365	1,339	5,003	586	216	30	78	24	1	2	171	1,108	88	199	..	1,110	201	489	1,022
August	..	..	..	73	3,645	3,718	388.80	1.97	6,391	10,109	3,274	4,178	..	..	1,614	2,331	367	1,396	5,255	683	159	16	77	24	9	6	81	1,065	72	132	16	1,308	159	467	1,039
September	..	..	..	64	3,288	3,352	390.50	1.90	6,801	10,153	3,306	4,147	..	..	1,157	1,561	346	1,064	4,809	564	253	15	85	19	2	5	101	1,044	102	10	1,255	213	656	1,629	
October	..	..	..	64	3,358	3,422	376.35	1.87	6,363	9,785	3,392	4,394	7	10	1,075	1,564	385	1,380	4,859	559	196	13	48	32	13	..	63	924	176	294	13	2,494	263	504	1,008
November	..	..	..	61	3,232	3,293	355.52	1.85	5,595	8,888	2,847	3,658	1	10	1,210	1,779	343	1,134	4,401	398	110	15	72	27	10	..	95	736	162	185	30	1,893	201	584	1,210
December	..	..	..	68	3,594	3,662	418.52	1.86	6,801	10,463	2,735	3,525	..	..	2,049	2,920	386	1,276	5,170	766	161	12	136	34	12	13	112	1,246	143	159	80	2,076	153	562	1,165
Total	..			848	38,394	39,242	370.66	2.19	71,445	110,687	37,090	47,656	11	34	14,684	31,289	4,277	15,006	56,062	6,363	1,980	199	1,013	214	64	99	943	10,875	1,131	2,352	200	16,787	2,247	5,883	13,108

* Government Servants include their wives and children.

† In calculating the Daily Average Out-patient Attendances, allowance has been made for Sundays and Public Holidays.

‡ These figures represent the number of attendances only, and not cases completed.

§ These figures include fillings done in deciduous teeth as well.

|| In this column only permanent fillings are included. All fillings of a temporary nature are included in the "Dressings Column". Fillings include all crowns and bridges.

¶ The figures in this column include such items as repairs and small partial dentures, and also orthodontic appliances.

TABLE 55
COMPARATIVE FIGURES FOR THE LAST 11 YEARS

Year	Total New Cases	Total Out- patients Attend- ances	Daily Average	Extrac- tions	Oral Surgery Opera- tions	Fillings	Dressings	Dentures	X-Rays	Revenue
										\$ c.
1951	7,149	29,168	106.06	22,973	..	3,490	12,556	1,457	3,571	29,125 65
1952	10,054	37,988	138.11	27,933	..	5,913	10,939	1,223	4,498	31,126 67
1953	14,444	50,449	183.42	51,972	..	6,006	31,604	1,726	6,298	44,535 59
1954	21,525	63,469	231.20	71,715	..	6,859	44,641	2,092	6,596	53,842 84
1955	27,895	82,107	278.74	83,392	847	6,039	52,201	1,873	6,761	34,738 85
1956	32,547	99,004	334.47	82,175	898	6,741	63,338	2,348	9,137	36,341 94
1957	36,508	107,700	362.05	67,785	646	9,048	64,018	2,304	10,683	32,068 65
1958	25,770	87,293	291.03	53,701	755	5,277	23,315	2,025	15,498	21,954 50
1959	33,958	101,754	340.10	61,826	887	7,660	20,314	1,638	16,610	22,368 10
1960	42,948	112,211	375.87	83,259	978	7,165	18,855	1,809	17,696	25,077 25
1961	39,242	110,687	370.66	56,062	1,131	10,875	16,787	2,247	13,103	29,849 75

HOSPITAL:--GENERAL (DENTAL)

OUT-PATIENTS

Year 1961

SINGAPORE

Diseases	New Cases				Repetitions			
	Male*	Female	Child	Total	Male	Female	Child	Total
1. Yaws .. ..	..	..	..	..	..	..	..	..
2. Fever including Malaria ..	..	..	..	..	..	..	..	..
3. Dysentery and Diarrhoea ..	..	..	..	..	..	..	..	..
4. Skin Diseases including Ulcers	..	..	..	..	..	..	..	..
5. Helminthic Infection ..	..	..	..	..	..	..	..	..
6. Venereal Diseases ..	..	..	..	..	..	..	..	..
7. Respiratory Diseases ..	..	..	..	..	..	..	..	..
8. Others ..	13,140	12,587	13,515	39,242	25,657	29,398	16,390	71,445
Total ..	13,140	12,587	13,515	39,242	25,567	29,398	16,390	71,445

OUT-PATIENTS—continued.

Nationalities	New Cases				Repetitions			
	Male	Female	Child	Total	Male	Female	Child	Total
Europeans ..	7	3	2	12	37	45	26	108
Eurasians ..	73	55	49	177	245	186	81	512
Chinese ..	9,650	11,021	12,458	33,129	19,482	26,117	14,959	60,558
Indians ..	1,843	679	468	2,990	3,630	1,483	717	5,830
Malays ..	1,517	816	527	2,860	2,197	1,540	591	4,328
Javanese ..	37	8	4	49	9	4	2	15
Japanese ..	2	3	1	6	..	..	..	..
Others ..	11	2	6	19	57	23	14	94
Total ..	13,140	12,587	13,515	39,242	25,657	29,398	16,390	71,445

PART III
HOSPITALS DIVISION

Chapter Ten

HOSPITALS DIVISION

INTRODUCTION

Until major expansions in the hospital services are achieved, the effort to maintain the services at the best possible levels becomes harder each year. This is because of the increasing demands due in part to the natural increase in population; and in part by the greater acceptance by the population of western medicine.

The total number of hospital beds represents an increase of 65 per cent over the pre-war figures. In comparison, the population increased between 1941 and 1961 from 769,216 to 1,687,300, an increase of 102 per cent. The main increases in beds, however, have been chiefly in hospitals for the treatment of the less acute conditions — e.g. in Trafalgar Home (for leprosy); in Tan Tock Seng Hospital (for tuberculosis); in hospitals for the chronic sick and mental defectives. In fact, the service lost about 600 general beds when the Tan Tock Seng Hospital was converted from a general hospital to one for the treatment of tuberculosis. This loss was only partially made up when it was decided to convert the Thomson Road Hospital from a hospital for the chronic sick to a general hospital.

TABLE 56

BEDS AVAILABLE IN GOVERNMENT HOSPITALS THROUGH THE YEARS

			Pre-war	1951	1956	1961
General Hospital	...	...	750	750	1,205	1,251
Thomson Road Hospital (District general hospital)	...	...	—	—	—	396
Kandang Kerbau Hospital (Maternity and Gynæcology)	...	...	180	240	316	438
Woodbridge Hospital (Mental)	...	...	2,000	1,800	2,040	1,869
Mental Defective Unit	...	...	—	—	—	46
Tan Tock Seng Hospital (Tuberculosis)			600	540	972	1,234
Middle Road Hospital (Venereal Diseases)	...	...	—	70	65	61
Middleton Hospital (Infectious Diseases)	...	...	250	250	250	250
Trafalgar Home (Leprosy)	...	...	200	640	973	1,023
St. Andrew's Orthopædic Hospital	...	...	60	70	120	120
Total			4,040	4,360	5,941	6,688

It was possible to accommodate the increase in the number of in-patients by increasing the turnover of patients. As a consequence, the percentage of occupied beds increased and the length of stay of patients has fallen. These figures may indicate more efficient use of hospital beds. Up to a point this is true, but many patients are now being treated as outpatients when they would have been admitted previously. Shortened length of hospital stay may not be adequate for treatment.

TABLE 57
CRUDE BED TURNOVER IN PRINCIPAL HOSPITALS

Hospitals	1955	1956	1957	1958	1959	1960	1961
General Hospital	29,215	26,825	29,207	29,937	33,244	33,960	33,652
Kandang Kerbau Hospital	94,446	102,759	114,427	125,826	141,569	123,774	112,308
Woodbridge Hospital	1,861	2,051	1,970	1,719	1,972	2,240	2,455
Tan Tock Seng Hospital	4,521	2,639	3,317	3,444	3,858	3,652	3,714
Middle Road Hospital	21,646	21,000	20,923	17,723	21,308	19,896	19,820
Middleton Hospital	17,130	15,708	15,088	15,120	14,564	20,488	16,464
Trafalgar Home	1,108	1,153	1,206	1,162	1,217	1,126	965
St. Andrew's Orthopaedic Hospital	2,108	2,783	2,917	2,092	2,017	2,141	3,375

TABLE 58
CRUDE PATIENT BED DAYS

Hospitals		1955	1956	1957	1958	1959	1960	1961
General Hospital	..	1,2493	13,641	12,749	12,192	10,979	10,777	10,847
Kandang Kerbau Hospital	..	3,529	3,561	3,189	2,901	2,579	2,953	32,50
Woodbridge Hospital	..	196,119	178,440	189,997	212,255	186,702	163,376	148,624
Tan Tock Seng Hospital	..	80,729	138,695	110,051	10,5396	94,814	100,228	98,257
Middle Road Hospital	..	16,862	17,429	17,445	20,595	17 129	18,394	18,416
Middleton Hospital	..	21,308	23,549	24,483	24,114	25,062	17,864	22,170
Trafalgar Home	..	329,375	317,405	302,767	314,041	299,916	325,016	377,930
St. Andrew's Orthopaedic Hospital	..	173,123	131,497	125,143	174,502	180,992	170,891	108,148

DEVELOPMENT

Two outpatient dispensaries were opened in the year. One was incorporated in the ground floor of a Housing and Development Board flat in its building estate at Kampong Tiong Bahru. This arrangement had every advantage as a separate site was not needed; and the planning and building was wholly undertaken by the Board.

The second outpatient dispensary was opened at Kampong Bugis. This is incorporated in a Community Centre and was planned and built by the Peoples' Association just as the one at Kampong Tiong Bahru was built by the Housing and Development Board.

At Woodbridge Hospital one block of four standard ward blocks was converted for use for chronic sick patients. In November, 35 chronic sick patients were transferred from the General Hospital thereby vacating beds for the more acutely ill.

Improvements to the kitchens at Woodbridge Hospital and the installation of a refuse incinerator at the Kandang Kerbau Hospital were completed at the end of the year.

A privately owned general hospital, known as the Mount Alvernia Hospital built by the Franciscan Mission of the Divine Motherhood, was opened on the 4th March, 1960. This hospital has 82 beds. The Singapore Children's Society completed extensions to its Convalescent Home increasing the beds by another 24.

LEGISLATION

The Tan Tock Seng Hospital ceased to exist as a Corporation on 1st April, 1961 when the Tan Tock Seng's Hospital (Transfer) Ordinance, 1961 came into operation and which repealed the Tan Tock Seng's Hospital Ordinance.

HOSPITALS

Available Beds

Government Hospitals

General Hospital	...	...	...	...	1,251
Thomson Road Hospital (District General Hospital)	...			...	396 (180 staffed)
Kandang Kerbau Hospital (Maternity)	...		...	...	438
Woodbridge Hospital (Mental)	...	...	...	...	1,869
Mental Defective Unit at Woodbridge Hospital	...			...	45
Chronic Sick Unit at Woodbridge Hospital	...		...	...	120 (35 staffed)
Tan Tock Seng Hospital (Tuberculosis)	...		...	...	1,234
Middle Road Hospital (Venereal Diseases)	...		...	...	61
Middleton Hospital (Infectious Diseases)	...		...	...	250
Trafalgar Home (Leprosy)	...	...	...	...	1,023
St. Andrew's Orthopædic Hospital	...	...	...	...	120

Institutional and Departmental Hospitals

Police Training School	...	...	...	...	20
Prisons Hospital	...	...	...	...	160
Opium Treatment Centre (St. John's Island)	...		...	...	20

Private Hospitals

Gleneagles (General Hospital)	...	...	...	89
Mount Alvernia (General Hospital)	...	...	...	82
Youngberg Memorial Hospital (General Hospital)	...	...	...	67
St. Andrew's Mission Hospital (for children)	...	...	...	60
Kwong Wai Siew Hospital (Cantonese Hospital)	...	...	...	434
Red Cross Crippled Children's Home	...	...	...	40
Singapore Children's Society's Convalescent Home	...	...	...	24
St. John's Home for the Aged	...	...	...	50

Private and Charitable Homes

Cheshire Home	...	...	...	42
Little Sisters of the Poor Home for the Aged	...	...	...	32
Hylam Sick Bay (Community Home for Hainanese only)	...	...	...	38
Khek Sick Bay (Community Home for Khek only)	...	...	...	40
Red Cross Crippled Children's Home	...	...	...	40
Singapore Children's Society Convalescent Home	...	...	...	24
St. John's Home for the Aged	...	...	...	50

BEDS AND SERVICES

TABLE

Number of beds available, principal types, on 31st December, 1961
(The figures exclude beds in Institutional and Departmental Hospitals and Charitable Homes)

			1960	1961
Total Hospital Beds	...	...	7,232	7,539
per 1,000 population	...	...	4.4	4.5
Government Hospital Beds	...	...	6,582	6,807
per 1,000 population	...	...	4	4
Private Hospital Beds	...	...	650	732
per 1,000 population	...	...	.4	.4
General Beds (Government)	...	...	1,627	1,647
per 1,000 population	...	...	1	1
Maternity Beds	...	...	390	438
per 1,000 population	...	...	.24	.26
Psychiatric Beds	...	...	1,869	1,869
per 1,000 population	...	...	1.1	1.1
Tuberculosis Beds	...	...	1,200	1,234
per 1,000 population	...	...	.73	.74

TABLE 59
IN-PATIENTS IN HOSPITALS, 1961

The following table shows the daily average number of patients, the number of patients admitted during the year, the number of deaths and the death rate per hundred treated.

Hospitals	Average Number of Patients	Admissions during the year	Discharges	Deaths	Mortality per cent
General Hospital	1026.08	41,190	45,254	2,479	5.89
Thomson Road Hospital ..	117.00	1,085	986	100	8.34
Kandang Kerbau Hospital (Maternity) ..	360.00	48,880	48,544	44	0.09
Woodbridge Hospital (including Mental Defective Unit and Chronic Unit) ..	2237.14	2,638	1,189	81	16.30
Tan Tock Seng Hospital (Tuberculosis) ..	1105.41	3,469	3,113	361	7.87
Middle Road Hospital (Venereal Diseases) ..	33.00	1,179	1,190	..	..
Middleton Hospital (Infectious Diseases) ..	160.40	3,927	3,906	59	1.43
Trafalgar Home (Leprosy) ..	702.00	278	272	11	2.85
St. Andrew's Orthopaedic Hospital ..	106.31	290	321	..	..

The attendances at outpatient dispensaries and clinics are given in the following tables.

TABLE 60

ATTENDANCES AT OUTPATIENT DISPENSARIES

Dispensaries	1961	proportion per 1,000 of population
Outdoor Dispensaries	1,071,251	655
Hospitals Outpatient Sections	928,669	565
City Council Dispensaries	364,255	221
Travelling Dispensaries	186,758	114
Total ...	2,550,933	1,555

TABLE 61

OUTPATIENT ATTENDANCES AT SPECIALISED CLINICS

Clinics	1961	Proportion per 1,000 of population
General Hospital	331,059	201
Thomson Road Hospital	4,782	2.9
Kandang Kerbau Hospital (Maternity)	198,365	121
Woodbridge Hospital	1,664	1
Tan Tock Seng Hospital	402,824	245
Middle Road Hospital	202,916	126
Trafalgar Home	11,895	7.3
Total ...	1,153,505	704.2

Casualty Department, General Hospital	110,923	68
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Staff. Four Israeli specialists, a pathologist, two bacteriologists and a pædiatrician, joined the service early in the year. Five Japanese doctors were also engaged on the grade of Senior Registrars in the departments of Pathology, Orthopædic and Ear, Nose and Throat surgery and in Obstetrics and Gynæcology.

TABLE 62

NURSING STAFF IN GOVERNMENT HOSPITALS AND OUTPATIENT SERVICES ON 31st DECEMBER, 1961

	Approved Establishment	Effective Personnel
Matron, Grade I	4	3
Matron, Grade II	11	10
Sisters	193	123
Staff Nurses and Student Nurses	1,075	937
Assistant Nurses	547	522
Staff Midwives	161	114
Pupil Midwives	190	154

TABLE 63

ANCILLARY STAFF IN GOVERNMENT HOSPITALS AND OUTPATIENT SERVICES ON 31st DECEMBER, 1961

	Approved Establishment	Effective Personnel
Radiographers	30	22
Physiotherapists	20	16
Occupational Therapists	13	10
Almoners	29	24
Dietitians	4	4

TABLE 64

STAFF

MEDICAL OFFICER STAFF IN PUBLIC HOSPITALS AND OUTPATIENT SERVICES

	GRADE 'E'		GRADE 'G'		SENIOR REGISTRAR		MEDICAL OFFICER	
	Approved Establishment 1961	Effective Personnel 1961	Approved Establishment 1961	Effective Personnel 1961	Approved Establishment 1961	Effective Personnel 1961	Approved Establishment 1961	Effective Personnel 1961
Medical Superintendents ..	1	..	4	4	..	..	..	..
Surgeons:—								
General	1	1	3	3	5	4	..	..
Orthopaedic	1	1	1	..	2	2	..	..
Ear Nose and Throat .. ..	..	..	1	1	1	..	..	..
Ophthalmic .. ..	..	..	2	1	1	..	..	..
Obstetrician and Gynaecologist .. ..	..	..	2	2	3	..	..	..
Physicians .. ..	..	..	3	3	6	3	..	..
Paediatrician	1	1	2	2	2	2	..	..
Chest Physician	1	1	4	3	4	1	..	..
Psychiatrist	1	1	1	1	2	1	..	..
Leprology .. ..	..	..	1	1	1	..	..	..
Venerology .. ..	..	..	1	1	..	..	..	..
Pathologist	1	1 (Act- ing)	1	..	2	..	..	..
Radiologist	1	1	2	..	1	1	..	..
Radiotherapist .. ..	..	..	1	1	1	..	..	..
Anaesthetist	1	1	1	..	1	1	..	..
General Duty Medical Officer .. ..	..	..	..	..	..	..	206	140
	9	8	30	23	32	15	206	140

Chapter Eleven

THE GENERAL HOSPITAL

IN this hospital and its environs are concentrated some of the most important of the hospital services in the State. The hospital itself is a general service hospital a teaching hospital and in some respects, a specialised hospital.

The hospital has clinical departments in medicine, surgery, orthopædic surgery, ear, nose and throat and ophthalmic surgery. Its departments of radiology and radiotherapy provide a central specialised service for all the other hospitals.

Its ancillary departments, the Medical-Social Service (Almoners), the Dietary Service in Physiotherapy and Occupational Therapy also are the headquarters of these hospital services.

The hospital is a teaching hospital for the training of medical students in their clinical years, and dental students are trained in the School of Dentistry and the dental clinic.

A School of Nursing is within the hospital. Training of laboratory technicians and of dispensing assistants are also undertaken largely in this hospital.

Situated within this hospital are the departments of the Outpatient Services and the Blood Transfusion Services and the Pathological Services.

Summary Activity. A summary of the activity for the year is given in the following table:

TABLE 65
ADMISSIONS AND DISCHARGES

Hospital	Admitted during the year 1961	Discharged	Transferred	Absconded	Died	Total	Percentage of deaths to total treated	Number of beds	Average daily number of patients
1st and 2nd Class	3,244	3,099	..	..	125	3,224	3.72	190	137.40
Children ..	13,673	12,799	131	1	720	13,651	5.18	358	258.01
3rd Class ..	24,273	222,74	331	19	1,634	24,258	6.58	703	630.67
Total ..	41,190	38,172	462	20	2,479	41,133	5.89	1,251	1026.08

Units. The clinical units of the hospital are as follows:

TABLE .
UNITS IN GENERAL HOSPITAL

Unit	Head of Unit
Medical Unit I ...	... Professor G. A. Ransome, M.R.C.S., F.R.C.P.
Medical Unit II ...	... Professor E. S. Monteiro, M.D., F.R.C.P., F.R.F.P.&S., D.C.H.
Pædiatric Unit ...	... Dr. Quah Quee Guan, L.M.S. (Singapore), D.C.H., M.R.C.P.E.
Surgical Unit 'A'	... Professor G. S. Yeoh, F.R.C.S., M.A., M.B., B.Chir.
Surgical Unit 'B'	... Mr. Yahya Cohen, F.R.C.S., F.R.A.C.S.
Surgical Unit 'C' Orthopædic	Professor A. G. Karlen, M.D. up to 31st January, 1961. Professor D. R. Gunn. D.O.M.S., M.B.CH.B., M.CH. orth, F.J.R.C.S.Ed.
Surgical Unit 'O' Orthopædic	Mr. D. W. C. Gawne, F.R.C.S.
Ear, Nose and Throat ...	Dr. Seow Li Jin, M.B., B.S., F.R.C.S.
Ophthalmic Unit ...	Dr. R. Robert Loh, M.B., B.S., F.R.C.S.

A summary of the activity of the Units for the year is given in Table 67.

Out-patient attendances at each of the clinics run by the units is given in Table 66. The clinics run by the units are essentially specialised clinics for follow-up of special cases and where referred cases are seen.

TABLE 66
OUT-PATIENTS FOR 1961

	New Cases	Repeats	Total
Surgical O.P.D. 'A' Unit ...	14,854	15,576	30,430
Surgical O.P.D. 'B' Unit ...	25,124	35,383	60,507
Orthopædic O.P.D. 'C' Unit ...	9,335	24,661	33,996
Orthopædic O.P.D. 'O' Unit ...	7,752	20,501	28,253
Ear, Nose and Throat Department O.P.D.	7,590	15,928	23,518
Eye Clinic ...	9,741	48,726	58,467
Medical O.P.D. Unit I ...	719	25,677	26,396
Medical O.P.D. Unit II ...	2,141	22,917	25,058
Pædiatric O.P.D. ...	4,680	39,754	44,434

TABLE 67
STATISTICS SHOWING UNIT ACTIVITY FOR THE YEAR 1961

	Medical Unit I	Medical Unit II	Pædiatric Unit	Surgical Unit 'A'	Surgical Unit 'B'	Orthopædic Surgical Unit 'C'	Orthopædic Surgical Unit 'O'	Ear, Nose and Throat Unit	Ophthal- mic Unit
Discharges and Deaths ..	4,644	5,673	10,372	6,578	7,057	2,850	1,184	1,266	1,509
Total Attendances Outpatient Clinics	26,396	24,958	44,434	30,430	50,507	33,996	28,253	23,518	58,467
Number of Beds allocated ..	150	183	274	169	162	100	60	60	93
Average ..	125	153	190	144	155	94	71	38	67
Bed Occupancy (Based on beds allo- cated) ..	85%	85%	64%	83%	97%	95%	118%	66%	71%
Turnover per bed ..	16 (points)	16 (points)	19 (points)	29 (points)	22 (points)	15 (points)	10 (points)	11 (points)	9 (points)
Crude average length of stay ..	9 (days)	9 (days)	6 (days)	7 (days)	8 (days)	12 (days)	21 (days)	9 (days)	15 (days)
Deaths ..	595	607	655	274	245	51	16	29	7
Percentage of Deaths to Inpatients total treated ..	12.84%	10.69%	6.37%	4.03%	3.46%	1.81%	1.38%	2.33%	.47%

Chapter Twelve

MEDICAL UNITS

MEDICAL UNIT I

THE report on the Medical Units touches chiefly on the important research carried out. The other aspects of unit activity having been summarised in previous sections.

Research

A large survey of blood cholesterol levels (mentioned in last year's report) among different ethnic groups in Singapore is in progress. The mean serum cholesterol levels rise with age, the Indian levels tending to approximate the European levels, and to be higher than the Chinese levels at all ages. Within the same ethnic group, mean serum cholesterol values tended to be higher in persons who were born and remained in Singapore compared with immigrants who came from either India or China. However, the means for Indian subgroups by country of birth were consistently higher than the means for the corresponding Chinese subgroups.

More cases of young hypertensives have been studied and confirmed the previous report that these are cases of renal artery stenosis arising as a complication of primary arteritis of the abdominal aorta.

An interesting observation has been the recognition that some of the cases of pyrexia of unknown origin were due to an infection by the virus of the dengue group similar to the hæmorrhagic fever reported in the Philippines and Thailand. The disease was first noted in May 1960 when patients presented with dengue-like symptoms, but had in addition severe thrombocytopænia leucopenia and a petechial rash. More than 100 of these cases have been recognised, the virus investigations have been undertaken by the Department of Bacteriology, University of Malaya. This hæmorrhagic fever seen in Singapore has so far followed a benign course unlike the more severe cases reported in the Philippines and in Thailand.

A survey based on a study of single stool specimens from 569 patients, drawn from a hospital population belonging to different ethnic groups and having different cultural backgrounds, failed to indicate an association between intestinal helminth infection and eosinophilic lung. The higher prevalence of eosinophilic lung in Indians than in the other ethnic groups, as reported previously, cannot be explained on a basis of differences in the prevalence of the intestinal helminths.

Persons with radiologically abnormal cardiac shadows discovered during a tuberculous survey conducted in Singapore were examined to ascertain the prevalence of cardiovascular disease. Of a total of 50,673 X-rayed, 1,100 (2.17 per cent) had abnormal heart shadows and of these 667 reported for clinical assessment. Of the latter 249 had definite evidence of hypertensive, rheumatic or congenital heart disease.

MEDICAL UNIT II

Artificial Kidney Unit

Through the generosity of the Lee Foundation, the Unit acquired a Kolff twin-coil artificial kidney and was thus able to set up the first Artificial Kidney Unit in this region under the direction of Dr. Khoo Oon Teik.

The members of the Unit have been organised and trained to deal with the complicated process of hæmodialysis. Five dialyses were done during the year.

Research

The survey on tetanus in Singapore reported in last year's report revealed some interesting points on treatment. Some of the leads are being followed in management of all cases of tetanus and it may be possible to assess the regime of treatment later. Based on the report, recommendations on the immunization against tetanus have been made.

A survey of poliomyelitis in Singapore in conjunction with Health Department, Bacteriology Department and Department of Social Medicine has been made. The survey suggested that oral vaccine was valuable only insofar that the same type was employed and that the use of a Type 2 vaccine was of questionable value in a Type 1 outbreak. Further, there did not appear to be any evidence of significant dissemination of oral vaccine in the community.

A study is in progress on cerebrovascular accidents admitted into the Unit, with respect to ætiology, associated non-cerebral cardiovascular disorders, cholesterol levels and prognosis. This is related to the continued study of cervical ganglion block on the cerebral circulation.

A study of the effect of M.A.O. inhibitors on cases of acute myocardial infarction. This study has shown an interesting trend which suggested that the status of anticoagulants might be different locally. A bigger trial is now being conducted.

Chapter Thirteen

PÆDIATRIC UNIT

THE Pædiatric Unit is run as two sections. The total accommodation provided is 300 beds — of which 20 are set aside for surgical cases — whose care is undertaken by the surgeons from Surgical Unit 'A'. The Unit is also responsible for the care of the neonates and premature infants at the Kandang Kerbau Maternity Hospital.

The record of the admissions and deaths in the Unit is as follows:

ADMISSIONS AND DEATHS

	1960	1961
Total number of admissions ...	10,712	10,480
Total number of readmissions ...	2,644	2,694
Total number of deaths ...	817	619
Total number of deaths within 24 hours	482	351
Percentage Mortality Rate ...	7.63 %	5.91 %
Percentage Mortality Rate excluding deaths within 24 hours ...	3.13 %	2.6 %

The largest number of admissions were for respiratory diseases, chiefly bronchopneumonia and gastro-enteritis. The incidence of tuberculosis remains high: there were eight cases of miliary tuberculosis and there were fewer cases of tuberculous meningitis. Poisonings are still common as reported previously. The number of poisonings from kerosene being nearly double the admissions for the previous year.

Out-patient attendances continue to increase. The number of new cases added to the registers was 4,680 (4,247 in 1960) and the repeat attendances of former cases was 39,754 (34,229 in 1960).

Chapter Fourteen

SURGICAL UNITS

SURGICAL UNIT 'B'

Surgical Units. The Units are now quite well staffed at the Lecturer-Senior Registrar level. There are, however, only a few more trainee medical officers in surgery which cannot bode well for surgery in Singapore. The shortage of anaesthetists is also of concern as this limits the number of operations that can be done. In spite of these difficulties about the same number of operations were carried out and a larger number of out-patients were dealt with during the year.

ORTHOPÆDIC SURGICAL UNITS

The orthopædic Surgical Units work under the same difficulties as recorded for the surgical units. They have an added disadvantage in that the accommodation for the units is inadequate. The plan for extensions and renovation to the units has not been allowed to proceed. Only the first phase of the project has been completed. This has provided for an X-ray department, but the other phases which will double the out-patient facilities and increase the number of beds available have not been approved.

In the meantime, the two units share the same out-patients section and the same operation theatres. This means that the full potential of the units are not being fully employed; work is carried out in unsatisfactory conditions. Yet work has to increase with the years: as an example, the number of casualties dealt with increases at the rate of 12 per cent a year.

EAR, NOSE AND THROAT DEPARTMENT

There has been little substantial change in the figures for work done in the department compared with those of the previous years. The figures, however do not show a change in the type of work done. The more complex case is undertaken and more major surgery is done which require more time for investigations and for operation while the minor and straight forward cases are more and more treated as out-patients.

OPHTHALMIC DEPARTMENT

Attendance figures have dropped with the introduction of a system where only cases referred to the unit are seen. The work has in no way decreased for the cases referred to the Unit are the more difficult ones which cannot be treated at general out-patient level.

A statement of the operations done in the surgical units is given in the following table:

TABLE 68
GENERAL HOSPITAL, SINGAPORE
OPERATIONS FOR THE YEAR, 1961

Month	SURGICAL 'A' UNIT			SURGICAL 'B' UNIT			SURGICAL 'C' UNIT			SURGICAL 'O' UNIT			OPHTHALMIC UNIT			EAR, NOSE AND THROAT		
	Major	Minor	Total	Major	Minor	Total	Major	Minor	Total	Major	Minor	Total	Major	Minor	Total	Major	Minor	Total
January ..	206	568	774	208	497	705	53	725	778	56	824	880	80	552	632	85	133	218
February ..	203	549	752	187	466	653	50	897	947	31	746	777	65	492	557	88	170	258
March ..	257	580	837	247	506	753	78	792	870	49	1,142	1,191	107	542	649	58	272	330
April ..	233	555	788	249	455	704	71	744	815	53	730	783	99	457	556	80	230	310
May ..	259	638	897	234	582	816	68	820	888	50	793	843	93	548	641	145	245	390
June ..	253	606	859	212	580	792	79	714	793	79	824	903	90	542	632	116	248	364
July ..	237	681	918	249	475	724	74	816	890	73	794	867	129	575	704	125	225	350
August ..	277	660	937	235	559	794	70	951	1,021	74	1,022	1,096	118	555	673	126	219	345
September ..	281	732	1,013	233	632	865	100	860	960	62	1,024	1,086	121	568	689	96	233	329
October ..	254	698	952	266	565	831	80	772	852	82	978	1,060	125	631	756	129	263	392
November ..	216	602	818	231	431	662	60	822	882	56	720	776	130	575	705	136	241	377
December ..	246	615	861	234	519	753	104	860	964	65	941	1,006	134	507	641	110	203	313
Total ..	2,922	7,484	10,406	2,785	6,267	9,052	887	9,773	10,660	730	10,538	11,268	1,291	6,544	7,835	1,294	2,682	3,976

Chapter Fifteen

ANÆSTHETIC UNIT

THE anæsthetists in this unit serve not only the General Hospital but also at the Kandang Kerbau Hospital and the Dental Clinic. There are only seven anæsthetists on the staff to provide this service — seven who have to be distributed to the six surgical units in the General Hospital, to the surgical theatre at Kandang Kerbau Hospital and to the Dental Clinic.

The work done by the unit is given in the following table:

TABLE 69

ANALYSIS OF ANÆSTHETIC ADMINISTERED

Unit			General	Spinal	Local	Major	Minor	Total
'A' Theatre	..	..	2,452	880	2,952	2,920	3,364	6,284
'B' Theatre	..	..	2,925	801	2,218	2,785	3,159	5,944
'C' Theatre	..	..	2,304	29	4,434	1,583	5,184	6,767
Kandang Kerbau Maternity Hospital	..	..	4,953	265	385	2,077	3,526	5,603
Ear, Nose and Throat	..	..	1,028	..	2,482	1,294	2,216	3,510
Eye Theatre	..	..	244	..	..	..	..	244
Dental Clinic	..	..	4,316	..	..	39	4,277	4,316
X-Ray	..	..	35	..	..	..	..	35

Chapter Sixteen

DEPARTMENT OF RADIOLOGY

THE department consists of two sections: the Radiodiagnostic and Radio-therapeutic sections.

While other hospitals and institutions have their own departments of diagnostic radiology, these are really sub-departments of the main one in the General Hospital.

The staff of the department is as follows:

STAFF IN THE DEPARTMENT OF RADIOLOGY ON 31ST DECEMBER, 1961

		<i>Radio- logists</i>	<i>Radio- therapists</i>	<i>Radiographers</i>	<i>X-Ray Assistants</i>	<i>Junior Photo- graphic Assistants</i>
General Hospital	..	4	3	20 (Diagnostic) (including 9 on probation) 3 (Therapeutic)	1	12
Tan Tock Seng Hospital	..	—	—	1	—	11
Kandang Kerbau Hospital		—	—	—	—	2
Institute of Health	..	—	—	1	—	1
Woodbridge Hospital	..	—	—	—	—	2
T.B. Control	..	—	—	—	—	2

A record number of 200,613 X-ray examinations in all X-ray departments was done in 1961. The 1960 figure was 188,992; thus, there was an increase of 11,621 cases (6.1 per cent). In addition, another 50,351 miniature chest X-rays were conducted by the A.D.M.S. (T.B.). The total number of X-ray examinations was 250,964.

On the other hand, the number of cases treated in the Radiotherapy Department was 590, as compared to 679 for 1960, i.e. a decrease of about 15 per cent. This was because all the four therapy machines had major break-downs through the year. Besides, the number of radiographers available was inadequate to cope with any further increase of work.

Number of cases radiographed in the various hospitals (diagnostic). The number of examinations carried out is shown in the following table (compared with figures for 1960):

TABLE 70

	1961	1960	Increase,	Decrease	Percentage
General Hospital ..	83,588	78,610	4,978	..	6.3%
Tan Tock Seng Hospital ..	85,576	78,257	7,319	..	9.4%
Kandang Kerbau Hospital ..	5,675	4,845	828	..	17.1%
Woodbridge Hospital ..	3,217	3,325	..	108	3.2% (decrease)
Institute of Health (for chests only) ..	22,559	23,955	..	1,396	5.8% (decrease)
Total ..	200,613	188,992	11,621	..	6.1% (increase)

Chapter Seventeen

PHYSIOTHERAPY DEPARTMENT

THE lack of staff again hampered the work in the department. There has been a nett loss of two physiotherapists. For this reason it was not possible to send a physiotherapist as previously, to the Red Cross Home for Crippled Children, the Spastic Children's Centre and to the Thomson Road Hospital.

The work in the General Hospital has, however, been maintained. The number of cases treated were: -

			1960	1961
New Cases	...	...	8,190	8,581
Repeats	...	...	134,209	142,780

Chapter Eighteen

OCCUPATIONAL THERAPY DEPARTMENT

Every established post in the institutions was filled in the year. It should now be possible to increase the range of activities among the patients.

The primary function of the work is to provide remedial activities and diversional therapy for patients. Recreational therapy is also helpful especially for the mentally disordered and those disabled and paralysed. This is provided largely by teaching of handwork crafts. The visible evidence of the work of the department is therefore the exhibition and sale of articles made by patients. Sale of articles from these exhibitions brought in \$4,883, in 1961.

Chapter Nineteen

MEDICAL RECORDS DEPARTMENT

Work on the organization of the Medical Records in the General Hospital continues but slowly. A W.H.O. expert working in the Federation of Malaya spent a few weeks in Singapore in July and in November 1961 to assist in the organization of this service.

The Records Office was moved into its own section in a house in the compound of the General Hospital.

The work of the Department and the Medical Records Sub-Committee was evident by the introduction of new forms for admissions and discharges, the "front sheets" for the Surgical and Ophthalmic Units, discharge certificates and appointment cards, hourly pulse chart and the introduction of a "one number" system in the Surgical Unit.

Chapter Twenty

BLOOD TRANSFUSION SERVICE

The Blood Transfusion Service is in the General Hospital and continues to serve all hospitals in Singapore except the service hospitals.

Staff. This consists of two Medical Officers. The third one is in the United Kingdom on a fellowship.

The Laboratory Technicians are now trained in the Department of Pathology. Four have completed training and have returned to the Department.

Work. 13,189 blood donations were received. Of these only 2,476 were from relatives of patients who receive the blood transfusions and 2,340 came from members of the Armed Forces.

TABLE 71
DONORS AND RECIPIENTS

			Donors	Recipients
1957	...	...	9,221	9,092
1958	...	...	9,952	9,622
1959	...	...	11,602	11,209
1960	...	...	12,874	12,595
1961	...	...	13,189	12,913

Donors give their blood free and no charges are made for blood transfusions. It is likely that there is fear attached to blood donation and a lack of public spirit rather than the lack of payment which makes it difficult to recruit donors in sufficient numbers.

The Chinese form the largest group of donors, but the numbers that came up were less than the previous year; and less than the number of transfusions given to Chinese patients. It was the same for other groups where the donations received were less than those given to patients of the same group. Donations from the Armed Services, and the Police continue to be given generously.

The number of new donors registered in 1960 was 5,078. More than half the blood donated therefore came from regular blood donors. The records show that 1,085 have given ten or more times; 315 had given twenty times; 72 had given thirty times; 12 had given forty times and 3 had given fifty times.

TABLE 72
DONORS AND RECIPIENTS BY RACE

Donors	Male	Female	Total Number	Transfusions given to	Male	Female	Total Number
European ..	2,464	203	2,667	European ..	131	202	333
Chinese ..	4,997	247	5,244	Chinese ..	4,770	4,934	9,704
Indian ..	1,745	27	1,772	Indian ..	639	604	1,243
Malay ..	2,657	27	2,684	Malay ..	489	945	1,434
Eurasian ..	677	27	704	Eurasian ..	99	51	150
Others ..	113	5	118	Others ..	23	26	49
Total ..	12,653	536	13,189	Total ..	6,151	6,762	12,913

TABLE 73
CATEGORIES OF DONORS

	1957	1958	1959	1960	1961
Voluntary Civilian Donations	5,371	5,061	5,549	7,073	8,373
Service Personnel ..	2,955	2,926	2,506	2,376	2,340
Relatives: taken	1,583	1,965	2,826	3,468	2,476
offered but rejected ..	107	401	353	352	270
New Donors	3,788	4,197	5,153	6,527	5,078

The use of blood in the hospitals is as follows:

TABLE 74
ANALYSIS OF DISTRIBUTION

General Hospital	...	...	...	7,730
Kandang Kerbau Maternity Hospital	...	...	...	4,172
R.A.F. Hospital, Changi	...	...	...	252
Other Government Hospitals	...	...	...	293
Other Hospitals	...	...	...	466
Total				12,913

About a third of the blood goes to patients at the Kandang Kerbau Maternity Hospital. There is a case of decentralising the service. A significant increase is noted in the use of blood by private practitioners and by non-government hospitals. Supplies are given on the understanding that they are replaced by relatives of patients.

The laboratory is open at all times for the grouping and cross-matching of blood. Investigations on blood group antibodies such as hæmolytic anæmias and neonatal jaundice are also undertaken.

The department is the central depot for the preparation, cleaning and distribution of all apparatus used in intravenous therapy used in the hospitals. During the year 15,574 blood giving sets, 16,500 saline giving sets and 13,928 blood taking sets were made up and distributed.

Chapter Twenty-one

DENTAL CLINIC

STAFF

THE staff comprises 12 Dental Officers and Housemen. Mr. G. Paul, B.D.S., F.D.S.R.C.S. (Ed.) has been promoted to Senior Registrar in Dental Surgery and Mr. Lim Kheng Ann returned from study leave having obtained the M.D.S. (Manchester), F.D.S.R.C.S. (Ed).

The University establishment at present numbers 12. Mr. Choo Teck Chuan, B.D.S., F.D.S.R.C.S. (Eng. and Ed)., Dip. Orth. R.C.S., joined the staff and Mr. J. A. Jansen, B.D.S., M.Sc.D. was appointed Professor of Prosthetic Dentistry. Mr. R. V. Lam, M.D.S. obtained the degree of M.S.D. from the University of Ohio, U.S.A.

General. The overall picture is set out in Tables 54, 55 and Form MD2. It gives the comparative figures for the last 11 years. For the third successive year the total of out-patient attendances is well over the 100,000 mark and the daily average remains high at approximately 370. Whilst the majority of patients still seek treatment for the relief of pain, there has been a marked increase in the amount of conservative work completed with an approximately 50 per cent increase over the previous year. The larger Government staff have contributed to this increase, since it is now possible to vary their duties and allow them to do more Conservative and Preventive Dentistry.

The demand for certain types of dental treatment is still heavy and this applies particularly to those seeking dentures and to children requiring General Anæsthetia for extractions.

Revenue. Revenue shows an increase of \$4,772.50 from \$25,077.25 to \$29,849.75 for last year.

Chapter Twenty-Two

ST. ANDREW'S ORTHOPÆDIC HOSPITAL

THE hospital has a bed capacity of 120 which are almost always occupied by children convalescent or under treatment for bone and joint tuberculosis, polio-myelitis and other orthopædic conditions. It is run as a Unit of the General Hospital and the Heads of the Orthopædic Units, Professor Gunn and Mr. Gawne visit the hospital regularly. The Resident Medical Officer is Dr. E. V. Crowe.

One of the deficiencies in the hospital is a lack of a Physiotherapist so that this important work to the patients is not as well covered as should be. The other difficulty is in up-keep of the buildings especially quarters for Nurses and Hospital Servants. The accommodation is not satisfactory and repairs are necessary.

ADMISSIONS AND DISCHARGES

	Admitted	Discharged	Transferred	Absconded	Died	Total	Percentage of deaths to total treated	Number of Beds	Average daily num- ber of patients
Males	189	..	..	..	..	..	..	..	..
Females	131	..	..	..	..	..	..	..	..
Total ..	320	200	121	..	..	321	..	120	106.31

Chapter Twenty-Three

THOMSON ROAD HOSPITAL

As this district hospital continued to expand, the plan for the new theatre, X-ray, Casualty Block and the new follow-up clinic were finalised.

The formation of the Medical Unit was completed when a 5th ward was opened. There are now 5 medical wards in operation dealing both with acute cases as well as with patients needing longer term treatment. This unit comprises of 3 male and 2 female wards with a total bed-strength of 180.

Staff. The Medical Officer staff consists of an Acting Medical Superintendent who is also the Physician and 4 Medical Officers.

The nursing staff consists of a matron, 6 sisters, a charge nurse, 12 staff nurses, 24 trained assistant nurses and 39 Pupil assistant nurses.

SCHOOL OF NURSING

The Preliminary Training School for assistant nurses which commenced in July, 1960 holds its classes in the vacant wards of the hospital. There are now 3 qualified Sister Tutors on the staff. The total intake of assistant nurses was 149.

PATIENTS

There were 1,085 admissions during the year. (Table 75).

An out-patient service is run for the staff and their immediate families and to follow-up of discharged patients. There were 4,782 attendances at the clinic.

Resulting from the mass X-ray survey at Farrer Park, Kampong Kapur, Secondary Schools and Stamford District persons with non-tuberculous chest diseases were referred to the hospital clinics for further management. These numbered 105 of the attendances at the clinic.

OCCUPATIONAL THERAPY DEPARTMENT

This was opened in March 1961. There was a total of 6,230 attendances by the end of the year from 169 patients.

During this same period articles made by patients were sold and a sum of \$773.70 was realised and banked in favour of the Government.

CLINICAL LABORATORY

The volume of work done was double that of 1960. There were 12,025 blood, 1,993 bio-chemical and 5,224 urine examinations. Others including the examination of smears, stools, etc. totalled 2,509.

A new Cambridge electrocardiograph arrived and by the end of the year 489 recordings were done.

DISPENSARY

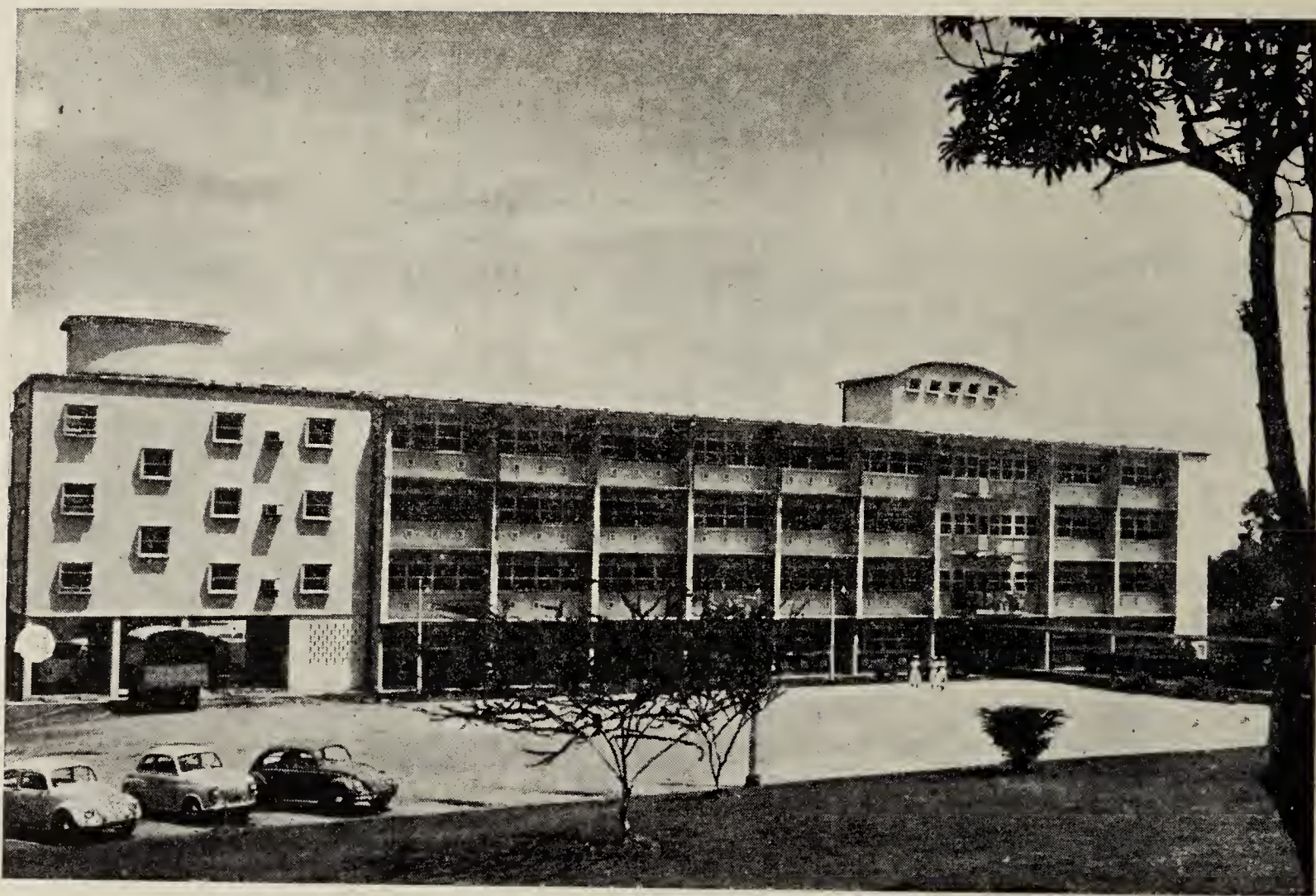
A total of 5,866 prescriptions were dealt with in 1961. With the arrival of a portable autoclave it was possible to sterilise some apparatus and preparations.

ALMONER'S DEPARTMENT

For the year a total of 418 patients (290 males and 128 females) were seen by the Almoner. In addition the Almoner was responsible for the Welfare Fund, liaison with other agencies and the supervision of students undertaking Part II of the Social Studies Course at the University of Malaya in Singapore.

TABLE 75
THOMSON ROAD HOSPITAL

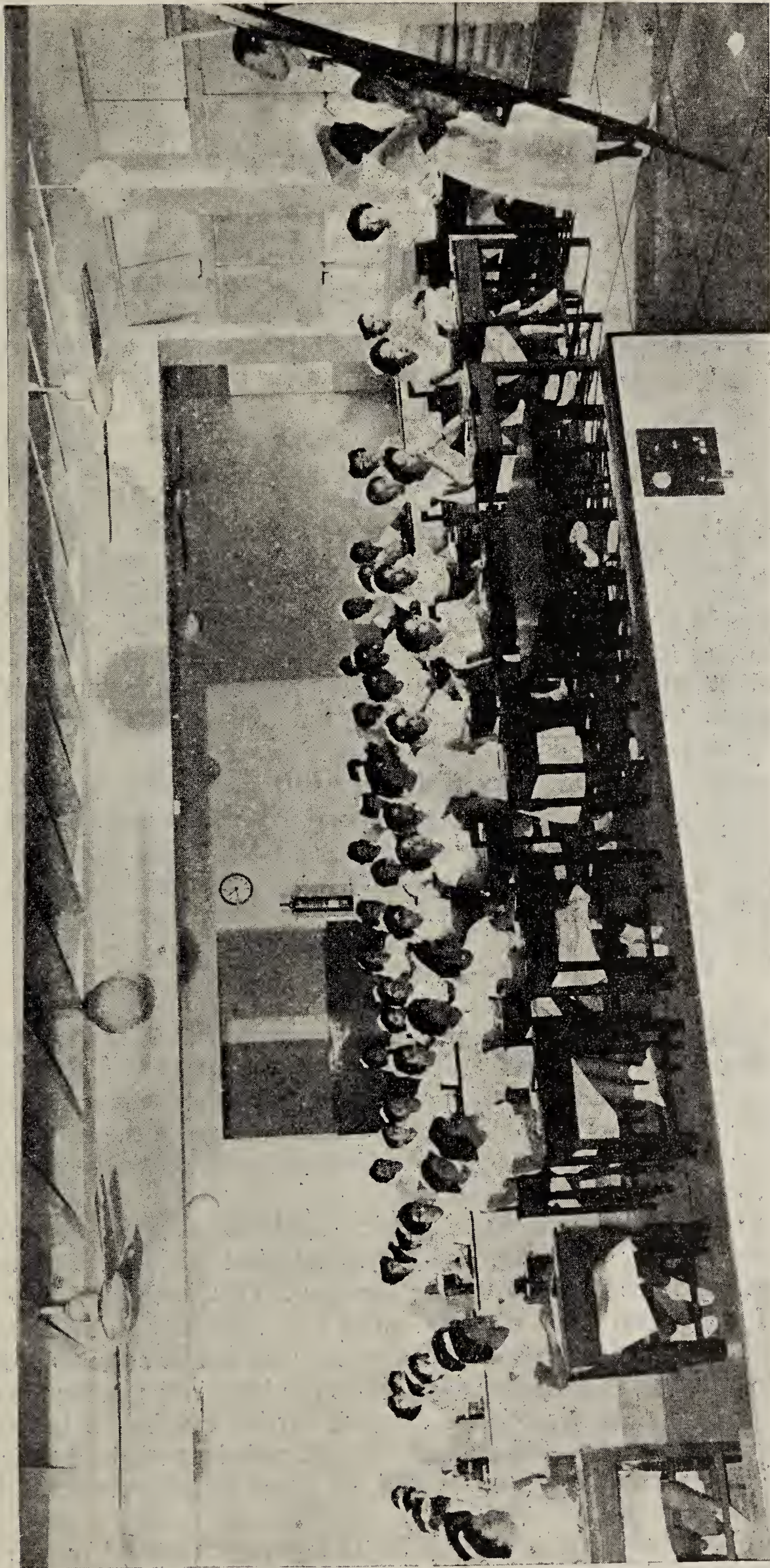
	Admitted	DISCHARGES AND DEATHS				Percentage of deaths to total treated	Number of beds	Average daily number of patients
		Discharged	Transferred	Absconded	Died	Total		
Male ..	701	580	40	..	83	703	108	83
Female ..	384	333	33	.	17	383	72	34
Total ..	1,085	913	73	..	100	1,086	180	117



Thomson Road Hospital



Nurses Lounge, Thomson Road Hospital



Assistant Nurses Training Class, Thomson Road Hospital

Chapter Twenty-four

MATERNITY AND GYNÆCOLOGY

KANDANG KERBAU HOSPITAL

The hospital bed capacity was brought up to 438 beds by the staffing of another vacant ward. In doing so it was possible to reorganise the units. In November the University unit which previously shared half the work of the hospital contracted down and its "service" responsibilities were reduced. The unit was allocated 60 beds for maternity cases and 27 beds for gynæcological cases.

In this way, the University Unit will concentrate largely on the teaching of undergraduate medical students, the post-graduate training of doctors and research.

The single Government unit was formed into two units and had to take on almost a double work-load on the remaining beds, while teaching of medical students still continued in its wards. This was possible by the return of three medical officers after completing their training in the United Kingdom (Drs. Goon Sek Mun, Ling Ngang Ngien and Y. M. Salmon). A rearrangement and distribution of cases in the wards by separating the "normals" from the "abnormals" and the reorganisation of the clinics will allow the officers to supervise and attend on the special cases.

The Head of the University Unit, Professor B. H. Sheares retired after 31 years of service in the hospital. Dr. Tow Siang Hwa was appointed acting head in his place. Dr. Chong Tuck Kwong and Dr. Lean Tye Hin headed each of the two Government units with Dr. Chong in overall charge.

Dr. S. N. Kapur was the Medical Superintendent of the hospital.

SERVICES

The maternity and gynæcological services are provided as in-patient and out-patient courses. Its out-patient services are run as special clinics in the out-patient section of the hospital for referred cases and for the follow-up of cases. As the only Government maternity hospital, some of the clinics are for normal ante-natal cases. A domiciliary delivery and domiciliary after-care service is also provided.

It is a teaching hospital where medical students from the University of Malaya receive their midwifery and gynæcological training. 220 medical students attended the hospital during the year. This institution also trains midwives for the Certificate of the Central Midwives Board. After varying periods of instruction depending on whether they are nurses or persons directly recruited for training as midwives, certificates are issued on passing the examination. In-service refresher courses are also carried out in the hospital for the midwives. A total of 66 nurses and 37 pupil midwives received their training during the year and 64 nurses and 33 pupil midwives obtained their certificates.

Admissions, Discharges and Deaths. The summary record on the work-load on the hospital beds is recorded in the following table.

TABLE 76
ADMISSIONS, DISCHARGES AND DEATHS

Maternity	Admitted	DISCHARGES AND DEATHS					Percentage of deaths to total treated	Number of beds	Average daily number of patients
		Discharged	Transferred	Absconded	Died	Total			
Paying Class ..	2,008	1,976	..	..	1	1,977	.05	44	23
Free Class ..	39,769	39,508	23	5	11	39,547	.03	280	264
Total ..	41,777	41,484	23	5	12	41,524	.03	324	287
<i>Gynecology</i>									
Paying Class ..	481	472	..	..	2	474	.41	15	8
Free Class ..	6,622	6,543	15	2	30	6,590	.45	99	65
Total ..	7,103	7,015	15	2	32	7,064	.45	114	73
Grand Total ..	48,880	48,499	38	7	44	48,588	.09	438	360

MATERNITY SECTION

The increase in the number of deliveries undertaken continues. The further load on the hospital can only mean that it will be even more difficult to maintain the level of the service.

TABLE 77

	1957	1958	1959	1960	1961
In-patients	36,159	39,761	44,736	48,272	48,880
Deliveries	27,763	30,146	33,709	36,267	36,590
% Deliveries/Patients	76%	76%	75%	75%	75%
Total live Births, Singapore ...	61,757	62,495	62,464	61,775	59,941
% Births in K.K./Total Singapore	45%	48%	54%	59%	61%

DOMICILIARY DELIVERY SERVICE

The main object of the service is the training of Medical Students, general trained nurses and pupil midwives in the Domiciliary practice. A total of 118 Medical Students, 56 trained nurses and 45 pupil midwives received training in this practice. Of 7,219 cases interviewed in the clinics, only 2,259 cases were finally selected for home confinement and because patients prefer to deliver in hospitals to be followed by after care in their homes. Of the 2,259 selected only 1,722 were attended in labour by the service, the others came into the hospital while in labour and a few sought the aid of private nursing homes or midwives. 34 cases were transferred to hospital owing to maternal and foetal complications.

DOMICILIARY AFTER CARE SERVICE

Of the 36,590 hospital deliveries, 10,294 were looked after in the patients' homes after being discharged from the hospital. The staff made 67,041 visits to the homes. 437 cases were referred to the doctors in the hospital for complications, 174 being mothers and 263 babies.

PÆDIATRIC SECTION

A consultant pædiatrician and a medical officer from the Department of Pædiatrics, General Hospital, examined and treated all babies with abnormalities and prematures below 4 lb. birth weight, and attended to all infants referred to them.

The two premature nurseries were for infants of birth weight of less than 4 lb. and seriously ill newborn. The latter were admitted because they needed special care.

Table 78 gives the admission and mortality figures for the different birth weights of infants treated in the nurseries.

TABLE 78

Birth Weight	Admissions	Deaths	% Mortality
Less than 2 lb.	54	54	100
2 lb. - 2 lb. 7 oz.	88	78	88.2
2 lb. 8 oz. - 2 lb. 15 oz. ...	118	73	61.0
3 lb. - 3 lb. 7 oz.	219	83	37.7
3 lb. 8 oz. - 3 lb. 15 oz. ...	269	77	28.6
4 lb. - 5½ lb.	161	68	42.2
More than 5½ lb.	147	42	28.6

The mortality rates for 1960 and 1961 are about similar although an outbreak of gastro-enteritis occurred in Premature Nursery I which necessitated the temporary closure of the nursery in order to prevent spread of the infection. On resumption of admission to Premature Nursery I, no further cases of gastro-enteritis were encountered.

The number of cases seen in the post-natal referrals was 1,405 compared with 1,943 in 1960. The greater number of cases in 1960 was mainly due to B.C.G. Adenitis in that year.

The attendance at the premature clinic in the three years 1959, 1960 and 1961 is shown in Table 79.

TABLE 79

			1959	1960	1961
New Cases	...	...	527	834	1,427
Repeat Cases	...	...	518	1,676	3,255

GYNÆCOLOGICAL SECTION

There were 7,103 admissions.

The number of deaths was 32 or 0.44 per cent as against 35 or 0.48 per cent for last year.

There were 9,488 operations performed of which 3,169 were on in-patients and 6,319 were on out-patients.

The operations performed were chiefly cæsareans, hysterectomies, colporrhaphies, dilatation and curettage, cautery of cervix, myomectomies and sterilization.

Chapter Twenty-five

TUBERCULOSIS SERVICE

TAN TOCK SENG HOSPITAL

Tan Tock Seng Hospital ceased to be a Corporation from 1st April, 1961 on which day, in pursuant to the Tan Tock Seng's Hospital (Transfer) Ordinance, No. 3/61, its employees were transferred to Government service. However, the hospital continues to be known as Tan Tock Seng Hospital in order to perpetuate the founder's name.

The Tan Tock Seng Hospital Corporation was a form of trust. The original benefactor was Mr. Tan Tock Seng who died in the middle of the 19th century leaving some land for a hospital. A Mr. Syed Alwi added to the endowment by giving more land to the hospital. But little else was added to the original trust.

Government took over the hospital development and management in all but name and was almost the sole contributor to the expenses of the hospital. The hospital was moved from its original site close to the centre of the present city, to Rumah Miskin (where the same site is now occupied by the Kwong Wai Siew Hospital) and finally in 1909 to its present site at Moulmein Road.

The Corporation's control over the hospital was exercised through its Committee of Management composed of Government officials, members of the public, and a "male descendant of Tan Tock Seng". Its function was limited to scrutiny of the estimate proposals and to deal with tenders for food supplies. It had no control of staff other than the "menial" grades (equivalent to Division IV employees in Government service).

The hospital was a free hospital for the treatment of the indigent sick. As a general hospital it was also a teaching hospital for the King Edward VII School of Medicine. In fact, the major clinical training of medical students prior to the Pacific War was undertaken in its wards and not in the General Hospital. After the war the hospital was transformed and developed as a tuberculosis hospital.

Since then the hospital has developed enormously. A new hospital complex consisting of four blocks, each of six wards, together with new kitchens, laundry and central sterile supply was completed in 1957. The bed capacity for the hospital was increased from 600 to over 1,250.

An out-patient department built by the Rotary Club was completed in 1959.

STAFF

The Clinic staff comprises 4 Chest physicians, a Senior Registrar and 14 medical officers.

The 2 matrons, Grade II headed the nursing staff of 24 Sisters, 14 staff nurses, 14 male nurses, 50 student nurses, 4 senior assistant nurses, 398 assistant nurses and 593 medical and health servants. During the year Miss Lim Poh Lan was promoted to Grade I Matron.

Three Sisters of the Franciscan Missionaire of the Divine Motherhood, together with 5 staff nurses and 58 student nurses comprised the nursing staff of the Mandalay Road section of the Tan Tock Seng Hospital.

Table 80 gives a return of tuberculosis cases admitted to Government hospitals in Singapore. Admission to the hospital for in-patient treatment is made according to various priorities on medical and social grounds.

TABLE 80

TUBERCULOSIS CASES ADMITTED TO GOVERNMENT HOSPITALS

			1956	1957	1958	1959	1960	1961
Tan Tock Seng Hospital:								
Pulmonary	..	..	2,061	2,442	3,064	2,588	2,752	2,562
Bones and Joints	..	..	79	133	171	169	115	129
Other forms	..	..	22	27	41	62	43	54
General Hospital:								
Pulmonary	..	..	944	942	785	660	703	647
Bones and Joints	..	..	146	302	338	332	157	293
Other forms	..	..	415	122	242	252	230	196
St. Andrew's Orthopædic Hospital:								
Pulmonary	..	..	—	—	—	—	19	21
Bones and Joints	..	..	104	235	245	121	115	238
Other forms	..	..	105	—	—	—	—	1
Total			3,876	4,203	4,886	4,184	4,134	4,141

TREATMENT

Hospitalisation, in conjunction with chemotherapy, is the accepted treatment of tuberculosis. The standard drugs used are streptomycin, Para-amino-salicylic acid and isonicotinic acid hydrozide.

Tests were made to discover drug sensitivity to mycobacteria tuberculosis. For cases whose tubercle bacilli were resistant to one or more of the above drugs, other drugs such as cycloserine, viomycin, pyrazmanicle and trescatyl (M and B.) were used. Where drug treatment failed to control the infectiousness of the disease, surgery was resorted to 171 minor surgical operations and 245 bronchoscopies were done at the Hospital.

Altogether 95 major thoracic operations were done by surgeons at the General Hospital for tuberculosis patients as follows:

Thoracoplasty:—

Modified Thoracoplasty including Singapore operations ... 39

Resections:—

Segmental ... 11

Lobectomy ... 34

Pneumonectomy ... 11

Total ... 95

The use of artificial pneumothorax as a form of collapse therapy has been totally abandoned. Pneumoperitoneum inductions performed on in-patients numbered 43 and refills 595.

ROTARY TUBERCULOSIS CLINIC

The Rotary Tuberculosis Clinic continued to cater for out-patients and the tremendous volume of work done can be gauged from the following return:

RETURN OF WORK—ROTARY TUBERCULOSIS CLINIC

	1957	1958	1959	1960	1961
New cases of Tuberculosis ..	2,405	2,790	2,685	2,863	3,613
Repeat visits of cases of T.B. ..	269,820	364,272	377,866	342,760	399,211

Cases seen by Specialists:

(a) New cases ..	2,796	3,434	3,946	2,703	3,613
(b) Old cases ..	36,751	44,474	49,768	47,935	49,173
X-ray examinations ..	75,973	82,682	90,697	78,094	85,576
Fluoroscopic screenings ..	4,023	1,743	1,422	1,189	—
Laboratory examinations ..	111,420	110,447	94,551	94,034	109,125
A.P. Inductions ..	6	—	Nil	Nil	Nil
A.P. Refills ..	16	—	Nil	Nil	Nil
P.P. Inductions ..	55	24	84	48	21
P.P. Refills ..	20,826	8,586	7,046	6,046	3,646

TRAINING

29 student nurses passed the Tuberculosis Nursing Examination. 78 nurses passed the 2nd Nursing Examinations and 226 nurses remained in training at the end of the year.

ALMONERS' DIVISION

The almoners have endeavoured to see the patients on their first visits to the Clinic. This first interview usually gives the almoner an opportunity of ascertaining if the patient has any problems. This is important because difficulties may arise from inadequate housing, food, rest or recreation, financial problems, unsuitable employment, unhappy family relationships or personnel difficulties leading to maladjustment.

The almoners continued to arrange for the fostering of babies of patients who, on the recommendation of the chest physicians, were unfit to look after their infants themselves.

The almoners have also continued to refer selected patients for vocational training to the Labour Department and have attempted individually to help patients to find employment in the open market.

PHYSIOTHERAPY DIVISION

Throughout the year there was one full time physiotherapist covering all pre-operative and post-operative chest treatments, all orthopaedic cases and various patients in the chronic wards.

SUMMARY OF WORK DONE

Year	Treatment	No. of Patients treated
1957	18,357	1,523
1958	25,032	1,965
1959	28,054	2,407
1960	20,019	2,400
1961	21,786	2,000

OCCUPATIONAL THERAPY DEPARTMENT

The occupational therapist continued to give efficient training to an average of 49 patients per month including disabled persons from the Labour Department, out-patients and some from chronic wards. The patients were offered instructions in the art of making raffia bags, basketry, embroidery and needlework.

DIVERSIONAL THERAPY UNIT

The Annual Sale of handicrafts which was opened by Puan Noor Aisha in October was a great success. The articles produced for sale comprised felt toys, knitted garments, sewing and embroidery and plastic toys. The success and smooth running of the Unit has been entirely due to the hard work of the voluntary workers.

RED CROSS LIBRARY

The Red Cross Library at Tan Tock Seng Hospital was kept active by nine voluntary female helpers. On two mornings a week these ladies push trolleys of books and magazines to wards and thereby gave the patients a chance to change books. The Kodak Company made a generous gift of 30 new View Masters with pictures.

DENTAL CLINIC

The Dental Officer who visited the Clinic twice a week on Tuesdays and Fridays attended to 2,240 patients. The work consisted mainly of extractions, treatment of dental abscesses, a few emergency fillings for the relief of pain and routine clearance of oral sepsis.

Chapter Twenty-six

LEPROSY

TRAFALGAR HOME

Trafalgar Home is an institution for the segregation and treatment of persons suffering from leprosy. The admission and the discharge of patients is under the control of a Leprosy Board. Patients whose lesions have lepræ bacilli in their smears are admitted. Other patients may be admitted if they require hospital treatment for complications due to the disease even though their skin smears do not have lepræ bacilli present in them. The infectious case is discharged only when smears from the skin lesions are found free of lepræ bacilli on four different occasions taken at consecutive months.

STAFF

Dr. Wong Mook Ow was appointed Medical Superintendent when Dr. P. Oorjitham resigned from the service.

The officers appointed to the Home as recorded in last year's report have settled in nicely and doing valuable and effective work.

The infirmary wards continue to be under the charge of the nursing nuns of the Franciscan Mission of the Divine Motherhood. But there are local nurses now in the service. All the nurses in the out-patient clinic and the male section of the Home are local nurses.

Nursing aides and the majority of other workers in the Home are drawn from among the patients. The allowances paid to these workers is on similar scales of equivalent grades in Government service.

PATIENTS IN HOSPITAL

The Home has 1,023 free basic beds. The number of patients at the end of the year is given in the following table:

TABLE 81

PATIENTS ON 31ST DECEMBER, 1961 BY RACE AND SEX

Nationality	Male Patients	Female Patients	Total
Chinese	444	181	625
Indians	37	5	42
Malays	27	9	36
Eurasians	1	—	1
Europeans	1	—	1
Total	510	195	705

TABLE 82

PATIENTS ON 31ST DECEMBER, 1961 — ADULTS AND CHILDREN (under 12 years of age)

Males		Females		Total
Adults	Child	Adults	Child	
441	69	171	24	705

ADMISSIONS AND DISCHARGES

The number of admissions of “positive” cases remains at about 100 a year. The new cases are discovered by the Contact Service and by other health centres, medical clinics and institutions. No case finding surveys have been undertaken.

TABLE 83

DISCHARGES AND DEATHS

		Males	Females	Total
Total patients remaining on 31-12-60	...	517	193	710
Admissions from 1-1-61 to 31-12-61	...	227	51	278
Discharges from 1-1-61 to 31-12-61	...	190	43	233
Absconsions from 1-1-61 to 31-12-61	...	27	3	30
Transferred to other hospitals	...	27	14	41
Transferred from other hospitals	...	20	12	32
Deaths	... ..	10	1	11

TABLE 84

ADMISSIONS FOR 1961 — BY RACE

	Chinese		Indians		Malays		Total		Total No.
	Male	Female	Male	Female	Male	Female	Male	Female	
Adults	167	41	29	2	10	1	206	44	250
Child	21	7	—	—	—	—	21	7	28
						Total	227	51	278

TABLE 85

ADMISSIONS FOR 1961 — BY CAUSE

		Males	Females	Total
New positive cases	... ..	76	21	97
Formerly absconded cases returned	...	21	1	22
Relapsed cases	... ..	7	2	9
Conditional discharged cases re-admitted		3	—	3
Negative cases	... ..	120	27	147
Total	... ..	227	51	278

TABLE 86

DISCHARGES FOR 1961

		Males	Females	Total
Formerly positive cases discharged by Board 1961	... ..	68	13	81
Formerly positive cases discharged in previous year	... ..	10	1	11
Conditional discharges	... ..	13	1	14
Negative cases	... ..	99	28	127
Total	... ..	190	43	233

Drug Therapy. The drugs used are Dapsone tablets and Diphenyl Thiourea (Ciba 1906) singly or in combination. The use of newer anti-leprosy drugs and in different combinations are under study.

Orthopædic Surgery. The orthopædic surgeons from the Orthopædic Unit 'O', of the General Hospital visit the hospital at least once a week. Orthopædic surgery is conducted at the General Hospital.

Dental Service. Dental treatment is given to all patients as well as to the out-patients in the dental clinic attached to the Home. The dental officer has two weekly sessions. The work includes prosthetic dentistry.

ALMONER'S DEPARTMENT

The head almoner, Miss D. E. Browne was on 6 months leave but Mr. Pang Eng Huat with the assistance of Mr. P. P. Nair was able to carry on.

The work of the department is peculiar in two aspects. The first is with the segregated patient to help him adjust to the confines of the Home away from the family; the care of the family left without its breadwinner or mother; and if the patient is a child to arrange for his schooling. The second and probably the more difficult, is the rehabilitation of the discharged patient for there is still fear of leprosy. This is harder in the case of the disabled and the scarred one who has been away from work for a long time.

A monthly allowance of \$5 is paid to single patients by the Social Welfare Department. Contributions of food from the Catholic League of America continues to be received. Presents and monetary contributions are also received from various charitable organisations and from the Armed Services. Particular mention must be made for the help given by the Singapore Leprosy Relief Association. It takes an interest in the welfare of the patients especially of its children.

The children of patients are not allowed to be with their parents and are placed in the care of relatives or fostered out. Assistance in the care of these children is supervised by the almoners.

Occupational Therapy Department. Since the appointment of an occupational therapist more patients are coming to the department, especially from the men's wards. This allows patients a change from the wards and to develop new skills. For cases where manual dexterity of the hands is to be improved, individual attention is given.

Outpatients are regularly visited and provided with necessary materials and the finished articles collected and sold. Where necessary out-patients attend the department to learn a particular craft or to improve their technique.

School — The Lorong Buang Kok School. Teaching is now taken right through to Senior Cambridge level. There were 90 children attending in the beginning of the year but 5 children were discharged while 12 students were admitted to the Home.

There were three successful students at the Senior Cambridge Examinations last year and there were two successful for the Chinese School Certificate. One sat for the Cambridge examinations this year and two girls sat for the Chinese Secondary examinations.

Scouts and Girl Guides. The Scout Troop consists of 35 boys and the Scoutmaster is the Chief Hospital Assistant. Troop meetings are held weekly. In September the scouts visited the Sungei Buloh Settlement.

The Guide Company consists of 10 girls under the charge of Miss C. R. Fisher. Weekly meetings are held and picnics and outings were arranged during the year.

Irrawaddy Road Government Skin Clinic. Clinic sessions are held in the afternoons of weekdays. On Wednesday evening a late session is held chiefly for office workers. Attendances average 50 patients a day.

246 patients were added to the register of patients. The register has been kept since 1951. The total number of registered leprosy cases is now 4,729.

The nurses attached to the Clinic visit the homes of patients to check on contacts, check those who do not attend the clinic for treatment, supervise the welfare of families and the children of patients. Children of patients with negative reactions to Tuberculin are given B.C.G. vaccination and those with positive reactions have their chest X-rayed.

Chapter Twenty-seven

INFECTIOUS DISEASES

MIDDLETON HOSPITAL

THE Infectious Diseases Hospital which was formerly run by the City Council to which Government made an annual grant, was transferred to the Government Hospitals administration in 1960.

Staff. Dr. K. W. Leong, Acting Medical Superintendent, proceeded on a departmental fellowship to the University of Malaya to study for the Diploma in Public Health.

Dr. K. Karunakaran, Assistant City Bacteriologist acted in the post of Medical Superintendent.

Admissions. During the year there were 3,927 admissions and 59 deaths — a mortality rate of 1.5 per cent. There were no cases of smallpox, plague or cholera during the year. Because of an outbreak of cholera in the neighbouring countries preventive inoculation was given to all the staff in the hospital and a ward was kept in readiness to receive suspected cases.

Tables 87, 88 and 89 below gives the number of admissions, discharges, transfers and deaths for the year.

TABLE 87

NUMBER OF ADMISSIONS, DAYS IN HOSPITAL AND DEATHS BY ETHNIC GROUPS

Ethnic Group	REMAINING 1960		ADMITTED 1961		TOTAL		DEATHS
	No. of patients	No. of days in hospital	No. of patients	No. of days in hospital	No. of patients	No. of days in hospital	
Europeans ..	..	..	7	46	7	46	..
Eurasians ..	..	..	49	392	49	392	..
Chinese ..	135	7,752	2,263	29,366	2,398	37,118	50
Indians and Pakistanis	42	2,736	999	8,229	1,041	10,965	6
Malays ..	8	1,094	504	4,828	512	5,922	3
Javanese ..	2	33	47	327	49	360	..
Others ..	2	92	58	480	60	572	..
Total ..	189	11,707	3,927	43,668	4,116	55,375	59

TABLE 88

	Remain- ing 1960	Admit- ted 1961	Trans- ferred to other hospitals	Died	Remain- ing 1961	Deaths %	Average daily number of patients
Male ..	101	2,371	17	40	79	1.6	..
Female ..	88	1,556	3	19	72	1.1	..
Total ..	189	3,927	20	59	151	1.4	160.4

TABLE 89

ADMISSIONS OF THE MORE IMPORTANT DISEASES FOR THE LAST 10 YEARS

Diseases	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961
Amoebic Dysen- tery ..	22	134	122	136	126	197	156	112	249	261
Bacillary Dysen- tery ..	9	25	18	17	26	74	60	36	70	96
Chickenpox ..	450	836	1,313	1,769	1,488	1,039	472	987	1,453	975
Clinical Dysen- tery ..	..	16	34	35	63	150	92	68	161	224
Cerebro-Spinal Meningitis ..	2	4	2	..	..	..	4	..	..	..
Diphtheria ..	427	332	345	460	552	712	547	519	642	587
Erysipelas ..	3	..	3	..	2	3	1	..	3	..
Measles ..	142	117	182	200	301	153	357	146	178	318
Mumps ..	15	9	35	54	52	14	43	47	55	47
Pneumonia ..	..	..	..	..	..	..	1	4	3	1
Plague ..	..	..	..	..	..	..	..	..	..	..
Poliomyelitis ..	50	41	70	19	37	52	405	66	201	48
Rubella ..	9	..	1	..	86	36	7	9	16	5
Scarlet Fever ..	..	..	..	..	..	1	..	..	..	..
Smallpox ..	..	..	..	..	..	..	..	10	..	..
Tropical Typhus ..	92	4	7	..	1	..	1	..	..	..
Typhoid Fever ..	117	91	125	114	76	118	127	160	174	155
Whooping Cough ..	3	..	10	5	85	30	38	15	39	23
Cholera ..	..	..	..	..	..	..	..	..	..	..
(Other Diseases/ Carriers and Observations)	455	440	647	503	936	1,083	1,368	1,272	1,680	1,187
Total ..	1,796	2,049	2,914	3,312	3,831	3,662	3,679	3,451	4,924	3,927

DIPHTHERIA

During the year the number of diphtheria admissions continued at a high level: 587 admissions and 27 deaths giving a mortality rate of 4.6 per cent. Fifty-six cases required tracheotomy for respiratory obstruction. Five patients out of these 56 died from complications.

TABLE 90

DIPHTHERIA ADMISSIONS AND DEATHS FOR THE LAST 10 YEARS

Year	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961
Admissions ..	427	332	345	460	552	712	548	519	642	587
Deaths ..	80	47	34	41	47	58	34	23	32	27
Mortality rate	18.73	14.15	9.86	8.91	8.51	8.14	6.20	4.43	4.98	4.6%

TABLE 91
MONTHLY DIPHTHERIA ADMISSIONS AND DEATHS FOR 1961

Month	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Admissions ..	64	43	46	46	58	37	51	40	59	58	32	53	587
Deaths ..	3	3	3	1	3	..	2	2	3	3	1	3	27

Carriers. A total of 308 Contacts were admitted and treated as Diphtheria carriers.

TABLE 92
DISTRIBUTION OF CASES BY MONTH AND LOCALITY

Month	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Urban ..	58	37	38	39	48	34	44	35	46	44	27	40	490
Rural ..	6	6	8	7	10	3	7	5	13	14	5	13	97
Total ..	64	43	46	46	58	37	51	40	59	58	32	53	587

TABLE 93
DIPHTHERIA ADMISSIONS AND DEATHS BY AGE AND SEX GROUP

Age Group	Admissions		Total Admissions	Deaths		Total Deaths
	M.	F.		M.	F.	
Under 1 year ..	28	20	48	2	2	4
1 year ..	26	9	35	3	..	3
2 years ..	44	43	87	7	2	9
3 years ..	33	31	64	3	1	4
4 years ..	32	29	61	2	3	5
5 years ..	27	23	50	1	..	1
6—10 years ..	58	101	159	..	1	1
11—15 years ..	20	41	61	..	..	..
16—20 years ..	..	10	10	..	..	..
21+ ..	3	9	12	..	..	..
Total ..	271	316	587	18	9	27

TABLE 94

DIPHTHERIA ADMISSIONS AND DEATHS BY ETHNIC GROUP

Ethnic Group			Admissions		Total	Deaths		Total
			M.	F.		M.	F.	
Europeans	..	..	..	1	1	..	..	..
Eurasians	..	..	..	2	2	..	..	..
Chinese	..	..	246	268	514	17	5	22
Indians	..	..	10	20	30	..	4	4
Malays/Javanese	..	..	15	24	39	1	..	1
Others	..	..	..	1	1	..	..	..
Total			271	316	587	18	9	27

TABLE 95

DIPHTHERIA: TYPE OF CASES

Type				Admissions		Deaths	
Laryngeal	..	..	..	61		5	
Pharyngeal	..	..	..	129		21	
Faucial	..	..	..	283		..	
Aural	..	..	..	18		..	
Nasal	..	..	..	89		..	
Cutaneous	..	..	..	6		..	
Opthalmic	..	..	..	1		1 Broncho-Pneumonia	
Total				587		27	

TABLE 96

DIPHTHERIA ADMISSIONS, DEATHS AND TRACHEOTOMY OPERATIONS

Total Admissions	..	..	587
Total Deaths	..	..	27
Case Mortality Rate	..	..	4.6%
Number Tracheotomies done	..	..	56
Number Deaths after tracheotomies			5

ACUTE ANTERIOR POLIOMYELITIS

There was a marked decrease in the number of cases during this year.

TABLE 97

ADMISSIONS AND DEATHS DURING THE LAST 10 YEARS

Year	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961
Admissions ..	50	41	71	19	29	52	404	66	201	48
Deaths ..	8	5	2	2	..	..	12	3	6	5

TABLE 98

POLIOMYELITIS: ADMISSIONS AND DEATHS EACH MONTH

Month	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Admissions ..	3	2	4	3	..	6	2	9	7	6	4	2	48
Deaths ..	..	..	..	1	..	..	2	1	1	..	..	..	5

TABLE 99

REGIONAL DISTRIBUTION OF POLIOMYELITIS CASES BY MONTH

Month	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Urban ..	1	2	1	3	..	4	1	5	4	3	1	..	25
Rural ..	2	..	3	..	..	2	1	4	3	3	3	2	23
Total ..	3	2	4	3	..	6	2	9	7	6	4	2	48

TABLE 100

AGE, SEX AND ETHNIC GROUPS OF POLIOMYELITIS CASES

Age Group	Euro- peans		Eura- sians		Chinese		Indians		Malays		Others		Total	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
Under 1 year	5	..	..	..	2	1	..	..	7	1
1 year	2	3	1	1	..	..	..	..	3	4
2 years	4	4	..	..	..	1	..	..	4	5
3 years	3	4	..	..	1	..	..	..	4	4
4 years	1	..	..	..	..	..	..	..	1	..
5 years	2	..	..	..	..	..	..	..	2	..
6—10 years	3	2	..	..	..	..	..	..	3	2
11—15 years	2	..	..	..	..	..	..	1	2	1
16—20 years
21+	1	..	3	..	1	..	..	..	..	..	5	..
Total ..	1	..	..	..	25	13	2	1	3	2	..	1	31	17

TYPHOID FEVER

TABLE 101

TYPHOID FEVER ADMISSIONS AND DEATHS BY ETHNIC GROUPS, AGE AND SEX
(Deaths in Brackets)

Age		0—10		11—19		20+		Total	
Sex		M.	F.	M.	F.	M.	F.	M.	F.
Europeans	..	..	..	..	..	..	..	..	..
Eurasians	..	..	..	..	..	..	..	..	..
Chinese	..	11	6	25	9	23	20	59 (3)	35
Indians	..	2	4	6	6	3	1	11	11
Malays	..	4	5	7	5	10	7	21	17
Javanese	..	1	..	..	..	..	..	1	..
Total	..	18	15	38	20	36	28	92 (3)	63

TABLE 102

TYPHOID FEVER—ADMISSIONS AND DEATHS BY MONTH

Month	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Admissions ..	13	9	14	15	19	9	18	3	13	11	13	18	155
Deaths ..	2	..	1	..	..	..	..	..	..	..	..	..	3

TYPHOID CARRIERS

During the year a total of 410 persons from ice-cream factories, dairy farms and the Water department were investigated for the exclusion of typhoid carrier state. They were all negative.

CHICKEN POX

Nine hundred and seventy two cases were admitted during the year.

TABLE 103

CHICKENPOX ADMISSIONS BY AGE, SEX AND ETHNIC GROUPS

Age		0—10		11—19		20+		Total		Total
Sex		M.	F.	M.	F.	M.	F.	M.	F.	Admission
Eurasians	..	3	5	4	3	2	4	9	12	21
Europeans	..	..	..	..	..	1	..	1	..	1
Chinese	..	46	18	32	22	80	34	158	74	232
Indians	..	72	40	87	38	299	45	458	123	581
Malays	..	19	19	17	8	42	3	78	30	108
Javanese	..	..	1	3	2	5	1	8	4	12
Others	..	6	..	..	..	6	5	12	5	17
Total	..	146	83	143	73	435	92	724	248	972

Chapter Twenty-eight

SOCIAL HYGIENE

MIDDLE ROAD HOSPITAL

The control and treatment of venereal diseases is maintained by the Social Hygiene Branch. It also runs clinics for treatment of dermatological complaints.

There was a decrease again in the incidence of venereal diseases while one notable feature was that no case of infantile syphilis was reported.

The facilities provided are:

- (1) Middle Road Hospital — situated in the centre of the town includes a 61 bedded hospital with out-patient clinics for both male and female cases;
- (2) Tanjong Pagar Clinic, Nelson Road in the Dock Area;
- (3) one male and two female travelling dispensaries serving the rural areas;
- (4) an Epidemiological Control Unit;
- (5) a Departmental Serological Laboratory;
- (6) an Almoner's Department.

ATTENDANCES

Year	In-patients	Out-patients	Total Attendances
1957	1,335	28,215 (11,502 Females)	190,549
1958	1,125	34,861 (14,997 Females)	197,333
1959	1,349	37,658 (16,723 Females)	218,270
1960	1,130	35,331 (16,515 Females)	201,102
1961	1,179	32,513 (16,397 Females)	202,916

The daily average attendances was 681 based on 297 working days.

INCIDENCE OF VENEREAL DISEASES

Although there was a decrease in the total incidence of Venereal Diseases cases, incidence of early syphilis were still high compared to 1958 and 1959:

Year	Syphilitic infections	Other V.D. infections	Total
1957	1,276	4,176	5,452
1958	1,035	4,198	5,233
1959	795	4,043	4,838
1960	860	3,435	4,295
1961	626	2,609	3,235

BREAKDOWN OF SYPHILITIC INFECTIONS

		1957	1958	1959	1960	1961
Primary syphilis	...	182	125	100	198	166
Secondary syphilis	...	33	49	26	24	21
Early Latent syphilis	...	249	168	143	116	123
Late Latent syphilis	...	577	528	394	431	466
Infantile syphilis	...	17	8	3	5	—

No case of infantile syphilis was reported. There were 11 cases of congenital syphilis over the age of two years.

The following table shows the breakdown of Tertiary Syphilis:

Nationality	Gummata and Skin	Bones and Joints	Cardio-vascular	G.P.I.	Tabes	Other Neuro Syphilis
<i>Male:</i>						
Chinese ..	2	1	6	6	1	12
Indian ..	1	..	1	..	..	1
Malaysians ..	..	..	1	1	..	1
Total ..	3	1	8	7	1	14
<i>Female:</i>						
Chinese ..	..	3	3	2	..	8
Indian ..	..	..	1	..	..	..
Grand Total ..	3	4	12	9	1	22

RATIO OF TERTIARY SYPHILITIC LESIONS

		1957	1958	1959	1960	1961
Neuro syphilis	..	43.6	56.0	49.0	50.7	62.7
Cardio-vascular	..	11.0	14.0	15.0	11.6	23.5
Cautaneous	..	22.7	11.4	9.0	13.0	5.9
Bones and Joints	..	27.1	18.2	27.0	24.7	7.9

GONORRHOEA AND NON SPECIFIC URETHRITIS

While gonorrhoea shows a downward trend, cases of non-specific urethritis have increased.

Year	Gonorrhoea	Gon. Ophthalmia	Gon. Compl.	Gon. and N.S.U.	N.S.U.	Total
1957 ..	2,856	33	10	177	522	3,598
1958 ..	2,808	37	6	253	804	3,908
1959 ..	3,027	67	13	268	914	4,289
1960 ..	2,529	106	9	244	773	3,661
1961 ..	1,970	106	9	436	1,472	3,993

The following table shows a breakdown of other venereal infections:

Year	Lympho-granuloma	Soft sore	Mixed infections	Granuloma inguinale
1957	33	1,045	188	—
1958	13	1,228	106	—
1959	15	784	137	—
1960	7	692	100	—
1961	16	472	36	—

SOCIAL HYGIENE TRAVELLING DISPENSARY

The following table summarises the work done:

Clinic	Male	Female	Antenatal	V.D. cases	Investigation cases	Total
<i>Central:</i>						
Yio Chu Kang .. Upper Serangoon Seletar .. Paya Lebar ..	586	2,847	2,809	33	3,400	3,433
<i>Rural West:</i>						
Bukit Timah .. Pasir Panjang .. Bukit Panjang .. Holland Road .. Jurong ..	783	4,463	4,349	47	5,199	5,246
<i>Rural East:</i>						
Kampong Batak Changi .. Ulu Bedok .. Siglap	3,709	3,668	31	3,678	3,709
Total ..	1,369	11,019	10,826	111	12,277	12,388

ANTI NATAL CASES

Nationality	No. of Antenatals	Primipara	Primipara positive	Multipara	Multipara positive
Chinese ..	6,433	760	4	5,673	24
Malaysians ..	979	147	1	832	1
Indian ..	3,399	361	2	3,038	26
Eurasian ..	14	2	..	15	..
Others ..	1	..	..	1	..
Total ..	10,826	1,270	7	9,559	51

EPIDEMIOLOGICAL CONTROL UNIT

This unit is responsible for case finding, contacting defaulters, follow up of treated cases, contacting family units, contacting promiscuous women and health propaganda.

13,789 home visits were made to defaulters or contacts of whom 7,512 cases reported. 619 cases were contacted by post of whom 348 attended.

260 new family units were registered in 1961 who were under treatment or surveillance. The total number of family units on the register was 4,226.

Social Welfare Department were responsible for sending 130 girls under the age of 18. Three cases had gonorrhoea and two had syphilis.

PROPHYLACTIC TREATMENT

There were 1,579 prostitutes on the register of whom 94 were new cases. 24 had gonorrhoea, 16 had syphilis and 4 had both. There were 20 male prostitutes on the register of whom 1 had gonorrhoea and 9 has syphilis. 12,317 prophylactic injections were given.

DERMATOLOGICAL CLINIC

Most of the skin cases attended to were of infective dermatitis, atopic and neuro-dermatitis, contact or allergic dermatitis and fungal infections. The rest included cases of seporrhoea psoriasis, collagen diseases, vesiculo-bullous dermatitis, tuberculosis and drug eruptions.

There were 22 cases of leprosy which were referred to the Irrawaddy Skin Clinic. 12,679 new cases and 83,160 repetition cases were seen during the year.

SUMMARY OF WORK DONE IN THE CLINICS

	1958	1959	1960	1961
Blood specimens for K.T. ..	33,983	38,316	37,831	37,420
C.S.F. for K.T. ..	198	243	330	480
Dark Ground Examinations ..	3,003	2,308	2,966	3,898
Smears for Gonorrhoea ..	26,482	36,432	27,396	28,980
Smears for Culture ..	134	49	191	214
Trichomonas Examinations ..	..	..	..	548
Aqua penicillin G used ..	3,540 mu	2,113 mu	5,386 mu	954 mu
Procain (PAM) penicillin ..	26,808 mu	25,207 mu	19,000 mu	13,965 mu
Penidure (Bicillin) ..	740 mu	10,976 mu	8,148 mu	10,805 mu

There were 46 cases of penicillin sensitivity showed by skin or anaphylactic like reactions. No deaths were recorded.

INVESTIGATION CASES

	1958	1959	1960	1961
Apprehensive group including antenatals and contact cases	16,545	17,909	13,969	11,488
Arthritis and Arthralgia	942	1,242	2,136	2,168
Non-Gonococcal urethritis, cervicitis, dysuria etc.	1,509	980	860	612
Trichomonas .. ..	..	..	..	439
Other genital infestations, warts, Balanitis, traumatic ulcers etc.	922	962	986	920
Yaws	15	34	15	29
Leprosy	27	12	45	22
Non venereal iritis, conjunctivities ..	299	244	387	402
Miscellaneous	376	396	560	459
Total ..	20,635	21,779	18,958	16,539

SEAMEN

Under the Brussel's International Agreement of 1924, seamen of all nationalities are afforded all the facilities for free diagnosis and treatment of V. D. and other allied cases. The following table shows a breakdown according to nationalities and diseases:

	Primary	Period not indicated	Gonorrhoea	Lympho-granuloma	Soft sore	Mixed inf.	Non specific urethritis	Skin cases	Investigation cases	Granuloma-inguinale	Total
Chinese .. ..	..	4	7	..	6	1	8	87	30	..	143
Indian .. ..	..	..	1	..	..	..	1	13	3	..	18
Malaysian ..	1	2	5	..	..	..	1	18	..	..	27
European ..	1	..	87	2	13	..	146	22	601	..	872
Others .. ..	..	..	1	..	..	..	..	..	1	..	2
Total ..	2	6	101	2	19	1	156	140	635	..	1,062

The number of seamen treated during the last 5 years are as follows:

1957	1958	1959	1960	1961
995	1,054	1,157	1,200	1,062

MINISTRY OF HEALTH AND LAW AND D.M.S., SOCIAL HYGIENE BRANCH, SINGAPORE

Table showing type of V.D. Male and Female Patients treated at the Middle Road Hospital,
Tanjong Pagar Clinic and Travelling Dispensaries

	IN-PATIENTS			OUT-PATIENTS (NEW CASES)				OUT-PATIENTS (REPETITIONS)				OUT-PATIENTS (TOTAL ATTENDANCES)			
	Male	Fe- male	Total	M.R.H. and Tr. Dispy.	T.P.C.	M.R.H. and Tr. Dispy.	Total	M.R.H. and Tr. Dispy.	T.P.C.	M.R.H. and Tr. Dispy.	Total	M.R.H. and Tr. Dispy.	T.P.C.	M.R.H. and Tr. Dispy.	Total
				Male	Male	Female		Male	Male	Female		Male	Male	Female	
<i>Syphilis</i>															
Primary .. ..	..	5	5	100	59	7	166	528	783	219	1,530	628	842	226	1,696
Secondary .. ..	..	3	3	10	7	4	21	140	195	223	558	150	202	227	579
Tertiary	20	11	31	21	10	18	49	454	541	556	1,551	475	551	574	1,600
Congenital .. ..	..	1	1	5	..	6	11	8	2	402	412	13	2	408	423
Period not indicated ..	6	107	113	178	89	172	439	12,679	2,089	6,234	21,002	12,857	2,178	6,406	21,441
<i>Other V.D. Cases</i>															
Gonorrhoea .. ..	..	86	86	716	841	413	1,970	12,442	2,853	3,515	18,790	13,138	3,694	3,928	20,760
Gonorrhoea Compli- cations .. ..	..	..	..	..	6	3	9	..	..	370	370	..	6	373	379
Gonorrhoea Ophthalmia ..	..	88	88	..	..	106	106	..	..	18	18	..	..	124	124
Soft Sores .. ..	..	..	..	244	228	..	472	1,950	1,587	..	3,537	2,194	1,815	..	4,009
Lymphogranuloma .. ..	..	..	..	..	16	..	16	..	53	..	53	..	69	..	69
Mixed Infections .. ..	..	..	..	2	24	10	36	49	400	2,552	3,001	51	424	2,562	3,037
Skin Diseases	315	328	643	6,164	2,541	3,974	12,679	47,608	14,752	20,800	83,160	53,772	17,293	24,774	95,839
Investigation Cases ..	..	209	209	3,236	1,619	11,684	16,539	15,451	14,670	6,300	36,421	18,687	16,289	17,984	52,960
Total	341	838	1,179	10,676	5,440	16,397	32,513	91,289	37,925	41,189	170,403	101,965	43,365	57,586	202,916

	IN-PATIENTS			NEW-CASES			REPETITIONS		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Chinese	234	668	902	8,298	10,989	19,287	72,420	28,985	101,405
Indian	77	59	136	4,559	1,672	6,231	36,439	3,564	40,003
Malaysian	27	104	131	2,374	3,649	6,023	19,728	7,286	27,014
Eurasian .. ..	..	6	6	24	54	78	86	503	589
European .. ..	..	..	..	856	1	857	525	..	525
Others	3	1	4	5	32	37	16	851	867
Total	341	838	1,179	16,116	16,397	32,513	129,214	41,189	170,403

Chapter Twenty-nine

WOODBIDGE HOSPITAL

WOODBIDGE HOSPITAL is a mental hospital with 2,000 beds. It also provides out-patient treatment for milder psychiatric illnesses and follow-up treatment for those discharged from the hospital. It operates four separate clinics. A total of 2,558 patients were admitted to Woodbridge Hospital during the year and a total of 2,185 patients were discharged. The associated out-patient psychiatric clinics dealt with 13,789 out-patient attendances during the year.

The matron who took charge of both male and female nursing services in the hospital during 1960 reverted to her original responsibility for the female section of the hospital while the nursing care of the male section of the hospital again was placed under the supervision of the Senior Male Nurse.

The School of Psychiatric Nursing had 31 male student nurses and 25 female student nurses under training for the Certificate in Mental Nursing. Of these 10 male students and 4 female students sat for and passed the State Final Examination in Mental Nursing.

One medical officer was sent to London during the year on a two-year Fellowship to study for the Diploma in Psychological Medicine.

In-Patient Services.—As in the previous year no certified patients were admitted.

Tables 106, 107 and 108 give the relevant figures of the in-patient services.

Out-Patient Services.—A considerable increase at the out-patient clinics was due to the early discharge of patients from the hospital.

Tables 109 to 112 show the statistics of all the out-patient services of the year.

THE PSYCHOLOGICAL DEPARTMENT

The Psychological Department offers services including psychological testing and advising, teaching and in association with the doctors, certain forms of treatment.

WOODBIDGE HOSPITAL REHABILITATION PROGRAMME

An old medical store house at the hospital was converted into a recreational hall which can accommodate about 600 persons. Concerts and stage shows with the patients taking part were held for the entertainment and recreational therapy of the in-patients.

TABLE 106

ADMISSION AND DISCHARGES				Male	Female
Number Admitted	...	...	...	1,518	1,040
Forms of Admission					
(a) Observation	...	...	...	1,458	1,014
(b) Certified	...	...	...	—	—
(c) Voluntary	...	...	...	21	19
(d) Remand	...	...	...	26	9
(e) Criminal Lunatic	...	...	...	8	—
(f) Vagrant	...	...	...	5	2
Number discharged	...	...	...	1,274	911
Absconded	...	...	...	1	—
Death	...	...	...	53	22

TABLE 107
DISTRIBUTION BY RACE

		Admissions	Deaths	Total cases treated	Average Daily Number of Occupied Beds
Europeans	...	12	—	12	—
Eurasians	...	23	2	43	—
Chinese	...	2,057	62	3,801	—
Indians and Pakistanis		346	9	499	—
Malays	...	114	2	228	—
Javanese	...	—	—	—	—
Others	...	6	—	7	—

TABLE 108
DISTRIBUTION BY DIAGNOSIS

Diagnosis	Remaining at end of 1960	YEARLY TOTAL		Total cases treated 1961	Remaining at end of 1961	Absconded and Discharged 1961
		Admissions 1961	Deaths 1961			
<i>Psychoses:—</i>						
Schizophrenic Disorders (Dementia praecox)	1,180	1,587	18	2,767	1,266	1,483
Maniac-Depressive Reaction	328	391	32	719	535	152
Involucional Melancholia	29	37	4	66	17	45
Paranoia and Paranoid States	39	48	2	87	36	49
Senile Psychoses ..	177	190	22	367	165	183
Other and Unspecified Psychoses ..	31	39	19	70	33	37
<i>Psychoneuroses and Disorders of Personality:—</i>						
Hysterical Reaction ..	16	15	..	31	9	22
Neurotic Depressive Reaction	77	82	..	159	107	52
Alcoholism ..	1	4	..	5	..	5
Other Drug Addiction	2	3	..	5	2	3
Other Psychoneuroses and Disorders of Personality ..	15	16	..	31	7	24
Mental Deficiency ..	137	146	..	283	152	131
Total ..	2,032	2,558	97	4,590	2,329	2,186

Out-patient Services.—Out-patient services provide both follow-up and consultative services.

Psychiatric Out-patient Department, General Hospital, Paya Lebar, Kallang and Bukit Timah.

TABLE 109
DISTRIBUTION BY SEX

Sex	Psychiatric Out-Patient Department General Hospital	Psychiatric Out-Patient Department Paya Lebar Clinic	Psychiatric Out-Patient Department Kallang Clinic	Psychiatric Out-Patient Department Bukit Timah Clinic	Total	Percentage of Total
Male	4,109	893	1,297	490	6,789	49.20%
Female	4,108	903	1,586	403	7,000	50.80%
Total ..	8,217	1,796	2,883	893	13,789	100.00%

TABLE 110
DISTRIBUTION BY RACE

Race	Psychiatric Out-Patient Department General Hospital	Psychiatric Out-Patient Department Paya Lebar Clinic	Psychiatric Out-Patient Department Kallang Clinic	Psychiatric Out-Patient Department Bukit Timah Clinic	Total	Percentage of Total
Chinese	7,454	1,657	2,533	803	12,447	90.27
Indian	473	75	128	55	731	5.30
Malays	192	48	161	35	436	3.16
Eurasian	65	13	55	..	133	.96
European	13	3	..	..	16	.12
Other Asians ..	20	..	6	..	26	.19
Total ..	8,217	1,796	2,883	893	13,789	100.00%

TABLE 111
DISTRIBUTION BY AGE

Years	Psychiatric Out-Patient Department General Hospital	Psychiatric Out-Patient Department Paya Lebar Clinic	Psychiatric Out-Patient Department Kallang Clinic	Psychiatric Out-Patient Department Bukit Timah Clinic	Total	Percentage of Total
0—10	67	..	6	..	73	5.30
11—20	1,421	183	419	126	2,149	15.08
21—30	2,772	675	1,010	304	4,761	33.00
31—40	1,947	443	659	218	3,267	23.00
41—50	1,223	263	484	139	2,109	14.30
51—60	605	174	235	89	1,103	7.00
61—70	164	36	66	17	283	2.00
71—80	17	20	3	..	40	.30
81—90	1	2	1	..	4	.02
91—100 .. ..	..	..	..	..	..	..
Total ..	8,217	1,796	2,883	893	13,789	100.00%

TABLE 112
DISTRIBUTION BY DIAGNOSIS

Diagnosis	Psychiatric Out-Patient Department General Hospital	Psychiatric Out-Patient Department Paya Lebar Clinic	Psychiatric Out-Patient Department Kallang Clinic	Psychiatric Out-Patient Department Bukit Timah Clinic	Total	Percentage of Total
<i>Psychoses:—</i>						
Schizophrenic Disorders (Dementia praxcox)	3,321	1,077	1,598	455	6,451	46.783
Manic Depressive Re- action	238	108	80	60	486	3.524
Involucional Melancholia	12	26	25	12	75	.543
Paranoid and Paranoid States	13	5	11	4	33	.239
Senile Psychoses ..	74	26	27	6	133	.964
Other and Unspecified Psychoses ..	35	42	50	20	464	3.365
<i>Psychoneuroses and Dis- orders of Personality:—</i>						
Hysterical Reaction ..	22	22	17	27	91	.659
Neurotic Depressive Re- action	836	164	235	107	1,342	9.732
Alcoholism ..	3	..	..	..	3	.002
Other Drug Addictions	30	25	75	10	140	1.025
Other and unspecified Psychoneurotic Re- action and Disorders of Personality ..	300	24	36	5	365	2.640
<i>Mental Deficiency</i>						
Other and Unspecified Mental Deficiencies	200	18	30	6	254	1.844
N.Y.D. Observational	2,816	259	699	181	3,955	28.680
Total ..	8,217	1,796	2,883	893	13,789	100.00%

Chapter Thirty

CHRONIC HOSPITAL

The Chronic Hospital has been temporarily established at the Woodbridge Hospital from 16th October, 1961. It occupies two wards of a hospital block. To these wards 30 patients were transferred from the General Hospital.

The staff consisting of a Sister, 14 assistant nurses, and 20 attendants are under the administration of the Medical Superintendent, Woodbridge Hospital and the Matron, Woodbridge Hospital. The other wards in the two hospital blocks will be opened when staff becomes available. The creation of the Chronic Hospital permits chronic patients occupying valuable beds in other hospitals to be transferred to this hospital thereby increasing the turn-over of acute cases from other hospitals.

TABLE 113
CHRONIC (WOODBIDGE) HOSPITAL

		Admitted	DISCHARGES AND DEATHS					Percentage of deaths to total treated	Number of beds	Average daily number of patients
			Discharged	Transferred	Absconded	Died	Total			
Male	..	11	..	..	..	1	1	9.09%	16	8.91
Female	..	19	..	..	..	1	1	5.26%	19	19.29
Total	..	30	..	..	..	2	2	6.67%	35	27.20

TABLE 114
MENTAL DEFECTIVE HOME (WOODBIDGE)

		Admitted	DISCHARGES AND DEATHS					Percentage of deaths to total treated	Number of beds	Average daily number of patients
			Discharged	Transferred	Absconded	Died	Total			
Male	..	18	..	..	..	2	2	11.11 %	{ Cots 2 Child 31 Adults 13	17.07
Female	..	32	2	..	1	2	5	7.41 %		28.23
Total	..	50	2	..	1	4	7	8 %	46	45.30

Chapter Thirty-one

THE OUT-PATIENT SERVICES

THE following are grouped in the Out-patient Services:

- (a) Casualty Department at the General Hospital;
- (b) the 19 Out-patient Dispensaries and 8 Public Dispensaries formerly of the City Council;
- (c) the Travelling Dispensaries of which there are 4;
- (d) Government Officials' Clinics and former City Council Staff Dispensaries; a dispensary for the families of Police and a small hospital for Police;
- (e) Prison Hospitals;
- (f) Opium Treatment Centre at St. John's Island.

It should be noted that the out-patient clinics run by hospitals and units of hospitals are quite separate and are clinics for referrals and follow-up of special cases.

The staff consists of a superscale administrative Medical Officer in-charge of the Out-patient Services and 52 timescale medical officers. In addition there are 78 nursing personnel and 14 hospital assistants as well as 3 pharmacists, 10 dispensing assistants and 108 hospital and health servants.

CASUALTY ROOM

110,923 casualties were seen in 1961 against 106,239 in 1960, an increase of 4,684.

	1957	1958	1959	1960	1961
Road Accidents	4,790	5,760	6,964	5,580	5,672
Examination for Alcoholic Intoxication	1,082	1,319	1,563	1,410	1,427
Rape and other Sexual Offences	56	67	45	30	26

TABLE 115

	NEW CASES			REPEAT CASES			Total
	Male	Female	Children	Male	Female	Children	
Casualty Department ..	50,394	13,192	25,967	11,353	2,835	7,182	110,923
Treat Dressings	..	..	..	..	..	..	353,217

Treatment and Dressing Room. This Section undertakes the dressings of patients from the Out-patient and Casualty Units, Surgical and Medical Out-patient Units of the hospital and injections of streptomycin of tuberculous out-patient cases from the Tan Tock Seng Hospital.

During the year under review 353,217 treatments were done, an increase of 22,786 from the previous year of 330,431.

Casualty Minor Theatre. Minor surgery in the nature of stitchings of minor wounds and incisions of abscesses were carried out at the Casualty Minor Theatre. During the year, 17,281 stitchings of wounds and 1,331 incisions of abscesses were done.

Laboratory. 30,174 routine specimens were examined during the year:

Urine	...	...	...	19,022
Blood	...	...	...	7,992
Faeces	...	...	...	2,508
Swabs, etc.	...	...	...	652
Total				30,174

OUT-PATIENT DISPENSARIES

General Hospital Out-patient Unit. 449,360 cases were recorded in 1961 against 492,925 in 1960, 223 persons were examined for assessment of age from the Labour Department, Commissioner for Registration, Immigration and Police Departments. 589 male and 187 female positive Tuberculosis cases were detected and referred to Tan Tock Seng Hospital.

TABLE 116

	NEW CASES			REPEAT CASES			Total
	Male	Female	Children	Male	Female	Children	
Out-patient Department	82,949	61,371	89,915	63,361	63,558	86,206	449,360

Kallang Outdoor Dispensary

This Out-patient Clinic functions every morning except Sundays and holidays. The School Clinic functions on Friday afternoons and Psychiatric Clinic on Wednesday afternoons.

During the year 197,492 patients were seen.

Extension work to this clinic started in October 1961 and it is expected to be ready in March 1962.

Paya Lebar Outdoor Dispensary

This Out-patient Clinic is situated at the junction of Upper Serangoon Road/Yio Chu Kang Road. It is housed in a two storey building with the old Post Office as extension. This clinic is used as a School Clinic on Monday and Friday afternoons and as a Psychiatric Clinic on Tuesday and Thursday afternoons.

During the year 167,086 patients were seen.

Pegu Road Outdoor Dispensary

This Clinic is situated at Pegu Road off Balestier Road.

During the year 158,841 patients were seen.

Anti-cholera inoculations were carried out in this clinic from September 1961 to November 1961 and 6,266 patients were inoculated.

Pasir Panjang Outdoor Dispensary

This Clinic is situated at 5½ milestone, Pasir Panjang Road.
During the year 56,342 patients were seen

Bukit Panjang Outdoor Dispensary

This Clinic is situated at Jalan Teck Whye in Bukit Panjang Village area.
During the year 151,701 patients were seen.

Anti-cholera inoculations were carried out in this clinic from September to November 1961 and 5,627 patients were inoculated.

Bukit Timah Outdoor Dispensary

This Clinic is housed in the Maternity and Child Health Clinic at Bukit Timah. The primary function of the clinic is to continue treatment of patients resident in this area, who have been discharged from the hospitals. A total of 47,579 attendances were recorded.

Kandang Kerbau General Out-patient Unit

This Clinic is for women and children only.
During the year 31,533 women and 59,577 children attended the clinic.

Pulau Brani Clinic

This Clinic is situated at the island of Pulau Brani.
During the year 23,004 patients were seen.

Pulau Tekong Clinic

This Clinic is situated at the island of Pulau Tekong.
During the year 12,938 cases were recorded.

Rural East Dispensary Services

The total attendances at the General Out-patient Clinics is shown below:

Changi Point Clinic	...	...	...	5,679
Kampong Batak Clinic	...	...	...	8,221
Gulega Road Clinic	...	...	...	4,646

These General Out-patient Clinics are housed in the Maternity and Child Health Clinics and function on sessional basis.

Thomson Road Outdoor Dispensary

This Clinic is situated at 5½ milestone, Thomson Road.
During the year 74,098 patients were seen.

Holland Road Clinic

This Clinic functions in the Holland Road Maternity and Child Health Clinic once a week on Wednesday mornings. The Medical Officer in charge of Pasir Panjang Outdoor Dispensary and his staff visit this clinic on Wednesdays.
During the year 7,206 patients were seen.

Lim Ah Pin Outdoor Dispensary

This Clinic is housed in one wing of the Lim Ah Pin Community Centre, at Lim Ah Pin Road. The number of out-patient attendances for the year were 60,006.

Anti-cholera inoculations were carried out in this clinic in September and October 1961 and 3,426 cases were inoculated.

Jalan Kayu Outdoor Dispensary

This Clinic is situated at the junction of Jalan Kayu/Yio Chu Kang Road, 8½ milestone. The out-patient attendances for the year were 64,444.

Tiong Bahru Outdoor Dispensary

This new clinic is situated at Jalan Membina (off Tiong Bahru Road). It is housed in the ground floor of Housing Board Flats. The clinic was opened on 21st August, 1961, and the out-patient attendances up to 31st December, 1961 were 26,291.

Kampong Bugis Outdoor Dispensary

This new clinic is situated at Kampong Bugis and it is combined with Kampong Bugis Community Centre. The clinic occupies the ground floor. It was opened on 6th November, 1961, and the out-patient attendances up to 31st December, 1961 were 5,677.

Public Dispensaries

The public dispensaries are situated at Stirling Road, Prince Philip Avenue, Kee Seng Street, New Bridge Road, Aljunied Road, Upper Serangoon Road, Dunearn Road and Desker Road.

A fee of 50 cents is charged for each out-patient attendance. The number of out-patients attendances recorded at each dispensary for the year are given below:

		<i>Out-patient attendances</i>
Stirling Road Public Dispensary	...	41,173
Prince Philip Avenue Public Dispensary	...	39,812
Kee Seng Street Public Dispensary	...	21,421
New Bridge Road Public Dispensary	...	40,332
Aljunied Road Public Dispensary	...	61,961
Upper Serangoon Public Dispensary	...	36,893
Dunearn Road Public Dispensary	...	73,706
Desker Road Public Dispensary	...	48,957

Travelling Dispensaries

Four Travelling Dispensaries, each with a hospital assistant in-charge, visits rural areas and attend to minor illness.

During the year 186,758 attendances were recorded.

TABLE 117
DISTRIBUTION OF STAFF OF OUT-PATIENT DISPENSARIES

Clinic	Sessions	Medical Officers	Pharmacists	Sisters	Nurses	Nurses (Men)	Hospital Assistants	Clerk	Laboratory Assistants	Dispensing Assistants
General Hospital Out-patient and Casualty Unit	Out-patient: 8 a.m. to 4 p.m. Casualty and Emergency Out-patients: 24 hours service	18	..	3	29	26	..	9	..	..
Kallang Outdoor Dispensary	Morning Sessions ..	4	1	1	3	..	1	2	1	2
Kampong Bugis Outdoor Dispensary	—	1	..	..	1	..	..	1	..	1
Paya Lebar Outdoor Dispensary	Morning Sessions and Afternoon Sessions	2 (full time)	..	..	2	..	1	1	..	..
Pegu Road Outdoor Dispensary	Morning Sessions and Afternoon Sessions	3 (full time)	1	..	2	..	1	1	..	2
Pasir Panjang Outdoor Dispensary	Morning and Afternoon Sessions (except Wednesday mornings)	1	..	..	1	..	1	1	..	..
Bukit Panjang Outdoor Dispensary	Morning and Afternoon Sessions	2	..	..	2	..	..	1	..	2
Bukit Timah Outdoor Dispensary	Morning and Afternoon Sessions	Part time work by M.O. Bukit Panjang	..	..	1	..	1	..	..	..
Kandang Kerbau General Out-patient Unit	Morning and Afternoon Sessions	2	..	..	2	..	..	..	..	..

TABLE 118
DISTRIBUTION OF STAFF OF OUT-PATIENT DISPENSARIES—continued.

Clinic	Sessions	Medical Officers	Pharmacists	Sisters	Nurses	Nurses (Men)	Hospital Assistants	Clerk	Laboratory Assistants	Dispensing Assistants
Pulau Brani Clinic	Morning and Afternoon Sessions	..	..	..	..	..	1	..	..	..
Pulau Tekong Clinic	Morning and Afternoon Sessions	Part time work by M.O.Changi Prison	..	..	..	..	1	..	..	..
Rural East Dispensaries Service:—										
Changi Point	2 Afternoon Sessions weekly	Do.	..	..	..	..	Part time work by H.A. i/c.	..	..	..
Kampong Batak	2 Afternoon Sessions weekly	Do.	..	..	..	..	Traveling Dispensaries	..	..	..
Gulega Road	1 Afternoon Session weekly	Do.	..	..	..	..		..	..	..
Tiong Bahru Outdoor Dispensary	—	1 (full time) and 1 (part time)	1	..	2	..	..	1	..	1
Thomson Road Outdoor Dispensary	Morning and Afternoon Sessions	1	..	..	2	..	1	..	..	..

TABLE 119
DISTRIBUTION OF STAFF OF OUT-PATIENT DISPENSARIES—*continued*.

Clinic	Sessions	Medical Officers	Pharmacists	Sisters	Nurses	Nurses (Men)	Hospital Assistants	Clerk	Laboratory Assistants	Dispensing Assistants
Holland Road Outdoor Dispensary	Once Weekly Morning Session	Part time work by M.O. Pasir Panjang	..	..	Part time	..	Part time	..	..	..
Lim Ah Pin Outdoor Dispensary	Morning and Afternoon Sessions	1	..	..	1	..	..	1	..	1
Jalan Kayu Outdoor Dispensary	Morning and Afternoon Sessions	1	..	..	1	..	..	1	..	1
Government Officials' Clinics	Morning and Afternoon Sessions	3	..	..	3	..	..	..	..	..
Police Families' Clinic	—	..	..	..	1	..	..	..	..	..
Police Hospital ..	—	1	..	..	..	..	1	..	..	..
Changi Prison Hospital	—	1	..	..	..	..	3	..	..	..
Local Prison Hospital	—	1	..	..	..	6	2	..	..	..
Opium Treatment Centre	—	Part time M.O.	..	..	..	2	..	..	..	..

Chapter Thirty-two

STAFF CLINICS

SENIOR OFFICIALS' CLINIC

THIS CLINIC is situated at General Hospital. The staff consists of 1 medical officer, 1 staff nurse, one office boy and 2 attendants. This clinic provides medical care for Government senior officials and their families. During the year 5,037 new cases and 8,850 repeat cases were treated at this clinic. Vaccinations and inoculations totalled 1,727. 1,346 injections and 736 dressings were carried out. Medical Board numbered 54 and recruits for examination 909.

Junior Officials' Clinic

This clinic is situated at General Hospital. The staff consists of 2 medical officers, 1 staff nurse, 1 junior nurse and 5 hospital servants. The number of cases seen in the clinic are given below :

New Cases	...	...	...	7,658
Repeat Cases	...	...	...	22,778
Injections	...	...	...	7,437
Dressings	...	...	...	2,209

Staff Dispensaries

The three staff dispensaries are: City Hall Dispensary, Alexandra Staff Dispensary and Lorong Lalat Staff Dispensary.

Free medical attention is given to all staff and open vote employees of the City Council and Housing Board by the three staff dispensaries. Dependents of City Council employees are not eligible for medical attention at these dispensaries. City Council employees total roughly 13,497 comprised of about 4,553 staff and 8,944 daily-rated workers. In addition, 1,253 employees of Housing and Development Board are seen. Employees are free to seek treatment from private practitioners in which case their medical certificates are accepted by the Council subject to endorsement by the Medical Officer i/c Staff.

The Senior Medical Officer i/c Staff is also performing the duties of Visiting medical officer to the three dispensaries at Johore maintained by the Water Department. Two visits are made to Johore every month in this capacity.

During the year, a total of 122,802 cases were attended at the three dispensaries of which 73,534 were new cases.

Staff.—The approved strength of medical officers for the three staff dispensaries is eight. At present there are only four medical officers leaving four vacant posts.

Chapter Thirty-three

PRISON HOSPITALS

CHANGI CONVICT PRISON

THE Changi Prison Clinic and Hospital is staffed by a medical officer, 3 hospital assistants and 3 Prison Orderlies.

A regular inspection of the Prison health and sanitation was maintained throughout the year.

The daily average number of prisoners in the Prison was 750. The total number of out-patient attendances during the year was 30,077. A total of 272 in-patients were admitted into the Prison Hospital. The number of minor operations performed during the year was 32. The dental officer visited the Prison once a week and examined 1,249 cases in the year as against 2,003 in 1960.

Anti-cholera inoculations were carried out in September. A total of 1,158 staff and families and 867 inmates were inoculated against cholera.

LOCAL PRISON, PEARL'S HILL

The Local Prison Clinic and Hospital is staffed by a medical officer, 8 hospital assistants and Prison orderlies.

Total number of prisoners admitted to Prison during the year was 4,919, the daily average being 923.

The Prison Hospital has 100 beds. There were 1,649 admissions to the Hospital. Total out-patients treated at the clinics were 29,602. Vaccination against small-pox were carried out on 4,919 cases. In the Prison Hospital there were 1,251 admissions for opium addictions, out of a total of 1,649 admissions, making 75.7 per cent.

The dental surgeon visited the Prison once a week; 1,401 dental cases were treated. In September, Prison medical staff visited Prison institutions at Local Prison, Ulu Bedok, St. John's Island and Pulau Senang and inoculated inmates, staff and their families against cholera, and a total of 2,330 inoculations were carried out.

OPIUM TREATMENT CENTRE

During the year the Advisory Committee investigated 642 male addicts (including 54 volunteers) and 21 female addicts (nil volunteers). A total of 478 males (including 54 volunteers) were admitted to St. John's Island for rehabilitation. By the end of the year, 640 males had completed their rehabilitation and were discharged, including 50 volunteers.

OPIUM TREATMENT FOLLOW-UP CLINIC

This clinic was conducted at the Outpatient Department, General Hospital every Friday afternoon, for the follow-up of patients who have been released from St. John's Island. This clinic was shifted from Institute of Health to Out-patient Department, General Hospital, on May 1961. The number of patients' visits to the clinic was 1,288 during the year.

POLICE HOSPITAL

The Police Training School Clinic and Hospital is for the members of the Police Force.

During the year, 9,040 out-patient attended the clinic and 362 recruits were examined. There were 302 patients admitted to the Police Training School Hospital in 1961.

An anti-cholera inoculation campaign was started for the Police Force in September and a total of 1,901 cases were inoculated.

POLICE FAMILIES' CLINIC

The staff nurse in-charge of the clinic visits the various Police stations and gives advice to patients with minor illnesses and sends more serious cases to the nearest Outdoor Clinics or to General Hospital. During the year 25,322 out-patient attendances were recorded.

Chapter Thirty-four

DISTRICT NURSING SERVICES

THE District Nursing Service continues to give nursing care to patients in their own homes and help in their rehabilitation of patients discharged from hospital and from the out-patient services.

Total number of patients on books	...	...	109
Total number of new patients received	...	...	416
Orthopædic	...	...	125
Surgical	...	...	152
Medical	...	...	139
Number included above of children under 12 years old	...	...	23
Total number of patients convalescent	...	...	289
Total number of patients sent to Hospital	...	...	82
Total number of patients died	...	...	47
Total number of nursing visits paid to the homes			13,928
Total number of supervisory visits made by Senior		...	738
Total number of patients carried forward to remain in book			86

The staff comprises of one Sister and six nurses.

STUDENT TRAINING

In April 1961, twelve Public Health nurse students passed their examination in Public Health course, including District Nursing at the Institute of Health. The course is conducted by selected medical staff and tutorials are given by (World Health Organisation) Public Health Nurse Tutor.

During the year 1961, 14 assistant health nurses spent a period of 6 weeks in the District Nursing Service as part of their training after which they sat for a practical examination.

Accommodation.—Headquarters of the Service remains at the General Hospital. The office is small and the utility room is most inadequate for the number of nurses using it.

Expansion.—Tiong Bahru Out-patient Clinic was opened in August 1961. A District Nurse uses the utility room there as her base and attends to the patients referred to her from there and also from the General Hospital.

Transport.—The nurses use public transport to pay their calls to patients and claim bus fares.

Chapter Thirty-five

TUBERCULOSIS CONTROL UNIT

STAFF

Dr. Wong Hin Sun, Chest Physician, Tan Tock Seng Hospital, was the Acting Assistant Director of Medical Services (Tuberculosis), Singapore throughout the year except for a short period between 10th April, 1961 and 22nd April, 1961 when Dr. Yeoh Seang Ann was then acting.

At the end of the year the composition of the staff was as follows:

Acting Assistant Director of Medical Services (Tuberculosis)
Medical Officer seconded from Tan Tock Seng Hospital
Medical Officer, part-time
Registrar, Tuberculosis Registry
Laboratory Technician
Six Laboratory Technicians-in-training
Sister
11 Staff Nurses
Two General Clerical Officers
Clerical Officer (Interpreter)
Six Clerical Assistants
23 Female Assistant Nurses, seconded from Tan Tock Seng Hospital
Two Junior Photographic Assistants
Seven Laboratory Attendants
Four Drivers, General Purpose
One Medical and Health Servant
Two Office Boys

ADMINISTRATION

The Tuberculosis Control Unit serves as the centre of all activities against tuberculosis. The main functions are:

- (a) the maintenance of a Central Tuberculosis Registry which is the centre for accurate, complete and current information on all notified tuberculosis cases;
- (b) the maintenance of a Central Culture Laboratory for the examination and culture of sputum and sensitivity tests of mycobacterium tuberculosis to anti-tuberculosis drugs;
- (c) the maintenance of a Recall Clinic for the follow-up of cases recalled from X-Ray Surveys, the periodical check-up of cases initially diagnosed as "Scars" and the assessment of cases not yet proven as active;
- (d) the maintenance of a Contact Clinic for the follow-up and examination, including home visits and clinic attendances, of all contacts of known cases;

- (e) to direct and supervise the State B.C.G. campaign;
- (f) to provide the School Tuberculosis Service;
- (g) to conduct Mass and Group X-Ray Surveys;
- (h) to teach and train personnel in all aspects of tuberculosis control, such as home visitors, laboratory technicians and staff nurses on the Public Health Nursing Course;
- (i) to formulate plans for the effective control of tuberculosis.

LEGISLATION

The legislation for compulsory B.C.G. vaccination is still in draft. It aims at compulsory vaccination for —

- (a) newborn infants;
- (b) primary school entrants and primary school leavers;
- (c) contacts.

CENTRAL TUBERCULOSIS REGISTRY

The number of tuberculosis notifications increased to 6,299 due to active case-finding by Government as well as by the Singapore Anti-Tuberculosis Association.

The following statement shows the number of notifications received for the year by month with comparable figures for 1958, 1959 and 1960:

STATEMENT SHOWING NUMBER OF NOTIFICATIONS REGISTERED IN 1958, 1959, 1960 AND 1961 BY MONTH.

Month	Number Registered			
	1958	1959	1960	1961
January	—	365	287	295
February	—	284	298	267
March	—	320	507	600
April	—	277	370	568
May	—	387	454	614
June	—	258	464	497
July	—	743	604	510
August	176*	834	554	425
September	256	756	449	511
October	626	541	323	660
November	639	421	353	628
December	382	480	394	724
Total:	2,079*	5,666	5,057	6,299
Monthly average:	416	472	421	525

* The Quarantine and Prevention of Disease (Amendment) Ordinance, 1958, No. 19 of 1958 which requires medical practitioners to submit notifications of tuberculosis cases to the Assistant Director of Medical Services (Tuberculosis), came into operation on 1st August, 1958.

The position of the Central Tuberculosis Register as at 31st December, 1961 was as follows:

CENTRAL TUBERCULOSIS REGISTER

Cases as at 1st January, 1961	...	...	11,337
Add cases registered for the year 1961	...	...	6,299
			<hr/>
Cases removed from register in 1961	...	...	17,636
			714
			<hr/>
Total:	...	...	16,922
			<hr/>
Number of cases on the register as at 31st December, 1961:			
(a) Pulmonary	...	...	16,815
(b) Extra-Pulmonary	...	...	107
			<hr/>
Total:	...	...	16,922
			<hr/>

Further statistics on tuberculosis appear in the appendices.

CENTRAL CULTURE LABORATORY

The Central Culture Laboratory continued its functions of performing bacteriological examinations in connection with tuberculosis, and sensitivity tests of mycobacterium tuberculosis to anti-tuberculosis drugs and the training of laboratory technicians-in-training. The work done during the year was as follows:

Type of Work	Total	Positive	Contaminated
Direct Smear	517	17 (3.3%)	—
Concentrated Deposit	10	—	—
Sputum Culture	2,314	246 (10.6%)	16
Laryngeal Swab Culture	21,238	2,302 (10.8%)	77
Miscellaneous	1,828	468 (25.6%)	40

Result of a further 3,998 cultures not known yet.

SENSITIVITY TESTS ON M. TUBERCULOSIS AGAINST ANTIBIOTICS
FOR THE YEAR 1961.

Sensitivity test done on 3,016 Positive cases against:

- | | |
|---------------------------------|-------------------------------------|
| (a) Isonicotinic Acid Hydrazide | } 5 units; 25 units; and 125 units. |
| (b) Streptomycin | |
| (c) Para-aminosalicylic Acid | |

PLUS

Sensitivity test done on 309 Positive cases against:

- | | |
|------------------|-------------------------------------|
| (d) Cycloserine | } 5 units; 25 units; and 125 units. |
| (e) Pyrazinamide | |
| (f) Viomycin | |
| (g) Treiscatyl | |

ANTIBIOTICS

SENSITIVE

RESISTANT

	5 Units	25 Units	125 Units	125 Units
(a) Isoniazid	2,387	253	339	36
(b) Streptomycin	1,698	124	289	905
(c) Para-aminosalicylic Acid	1,943	227	473	373
(d) Cycloserine	116	110	21	7
(e) Pyrazinamide	25	24	97	108
(f) Viomycin	86	104	50	14
(g) Treiscatyl	113	44	4	8

Result of a further 124 sensitivity tests not known yet.

MASS AND GROUP X-RAY SURVEYS

During the year 50,152 persons were radiologically examined.

Statement showing area for group surveyed, number X-rayed and number of abnormalities discovered on radiological evidence.

	Number X-Rayed	Active lung tuberculosis	Suspicious lung tuberculosis requiring investigation	Scars as a result of healed tuberculosis	Bronchiectasis and Cysts	Other non-tuberculous lung diseases	Heart abnormalities	Total of abnormalities	Technical Fault and Artefact
<i>Mass X-Ray Survey</i>									
Kampong Kapor ..	16,383	498	1,089	235	61	182	447	2,512	4
Stamford ..	15,743	316	1,480	192	33	135	269	2,425	28
Total ..	32,126	814	2,569	427	94	317	716	4,937	32
<i>Group X-Ray Survey</i>									
Woodbridge Hospital	927	3	28	12	4	9	18	74	4
Secondary School Leavers ..	13,018	92	356	71	11	53	269	852	11
Immigration Department ..	150	4	14	..	1	..	..	19	..
Base Workshop ..	2,013	85	202	17	2	26	36	368	..
Postal Services ..	608	..	37	2	..	4	..	43	1
District Workshop ..	378	4	30	2	..	7	..	43	..
Engineers Base Installation ..	501	10	56	7	1	8	1	83	..
Paya Lebar Airport	431	..	37	5	1	1	4	48	..
Total ..	18,026	198	760	116	20	108	328	1,530	16
Grand total ..	50,152	1,012	3,329	543	114	425	1,044	6,467	48

RECALL CLINIC

4,788 new patients were seen at the Recall Clinic. There was a total of 11,777 attendances.

TUBERCULIN TESTING AND B.C.G. VACCINATION

Newborn Infants.—The B.C.G. Team at Kandang Kerbau Hospital continued its work of giving B.C.G. vaccination to new-born infants delivered there. Of 33,469 infants discharged from the hospital in 1961, B.C.G. vaccination were given to 33,109 showing a response of 99 per cent as compared with 99 per cent in 1960, 96 per cent in 1959, 94 per cent in 1958 and 93 per cent in 1957. (Please see Table on Page 166).

B.C.G. vaccination of infants under the age of one month started in two Maternal and Child Health Clinics (Rural) in 1957 and subsequently extended to 20 centres was continued. In 1961 out of 10,460 infants born in the rural areas, 4,938 under the age of one month were vaccinated.

B.C.G. vaccination at City Clinics started in July 1958 was also continued. Of 12,891 infants born in the City outside Kandang Kerbau Hospital during the year, 6,420 were given B.C.G. vaccination.

Institutions.—During school vacations, the staff carried out H.M.P. testing and B.C.G. vaccination at the following institutions:

Salvation Army Children Home	School for the Blind
Salvation Army Girls' Home	Gimson School for Boys
Salvation Army Boys' Home	Prince Edward Road Boys Hostel
Salvation Army Nursery	Bukit Batok Boys Hostel
Mt. Emily Girls' Home	Girls Home Craft Centre
Handicapped Children Home	Victoria Street Creche
Red Cross Crippled Children Home	New Market Road Creche
Jalan Eunus' Muslim Women's Welfare Home	Moh Guan Terrace Creche
Perak House	Banda Street Creche
	Convent of the Holy Infant Jesus

The following were also tested and vaccinated: nursing staff at School of Nursing, General Hospital, and Tan Tock Seng Hospital; medical and dental students at the University of Singapore.

In all, 1,327 persons were tested and 139 received B.C.G. vaccinations.

School Children.—(Please see School Tuberculosis Service).

CONTACT EXAMINATION

Home Visits.—During the year nurses carried out home visits to 15,400 patients and contacts and recorded a total of 21,491 visits. Home visits are made to ensure that notified cases of tuberculosis are receiving treatment. It is also important that all contacts of these cases are examined and, where necessary, given treatment.

During the Mass X-ray Survey of Kampong Kapor District and Stamford District, nurses made a total of 73,696 home visits to residents to distribute attendance cards and to urge them to attend the X-ray Centres.

Contact Investigation.—All contacts of notified cases of tuberculosis who were below 15 years of age were tuberculin tested. Negative reactors to tuberculin were given B.C.G. vaccination. Positive reactors were X-rayed.

New contacts registered during the year numbered 8,874 and they made a total of 31,417 attendances at the Contact Clinic at Tan Tock Seng Hospital. All contacts of tuberculosis cases at schools were centralised and investigated at the School Tuberculosis Clinic at Institute of Health.

B.C.G. VACCINATION OF INFANTS AT KANDANG KERBAU HOSPITAL, 1961

Month		No. of infants discharged from Hospital	No. of infants given B.C.G. Vaccination	Percentage	RACE			
					Malaysians	Chinese	Indians	Others
January	..	2,564	2,535	98	215	2,082	216	22
February	..	3,319	3,292	96	263	2,724	287	18
March	..	2,658	2,623	99	208	2,180	221	14
April	..	2,630	2,607	99	210	2,153	229	15
May	..	2,655	2,634	99	213	2,167	239	15
June	..	2,642	2,537	99	199	2,115	207	16
July	..	2,628	2,620	100	214	2,179	206	21
August	..	2,807	2,774	99	253	2,285	223	13
September	..	2,825	2,770	98	259	2,235	248	28
October	..	2,890	2,846	98	274	2,240	312	20
November	..	3,057	3,023	99	282	2,535	187	19
December	..	2,884	2,848	98	282	2,313	243	10
Total		33,469	33,109	99	2,872	27,208	2,818	211

SCHOOL TUBERCULOSIS SERVICE

Since the transfer of control from the Assistant Director of Medical Services (Health) in April, 1958 this Service has been re-organised and the work now consists of:

- (a) tuberculin testing and B.C.G. vaccination of school children;
- (b) case-finding;
- (c) investigation and treatment of cases found in schools;
- (d) contact investigation of Index cases found in schools;
- (e) feeding of infected and undernourished school children.

Tuberculin testing and B.C.G. vaccinations were done in 594 schools (49 Malay schools, 283 Chinese schools, 12 Indian schools and 250 English schools). All children in Primary I and Primary VI classes, with parental consent, received Heal multiple puncture tuberculin tests and negative reactors to these tests were given B.C.G. vaccination. Severe reactors (Heal Positive iii and iv) were X-rayed.

Tuberculin Testing (HMP) of School Children, 1961

Age Group in Years	Number Tested	Number and Percentage Positive
0 — 6	24,289	13,167 (54.21)
7 — 14	34,080	26,819 (78.69)
15 — and over	932	869 (93.24)

During the year, 59,301 children were tuberculin tested. Out of this number 18,439 were negative reactors and were given B.C.G. vaccination. 8,305 children were given chest X-ray examinations.

Tuberculin Testing (HMP) and B.C.G. Vaccination of School Children
Number of Schools Done

Year	Malay	Chinese	Indian	English	Private	Total
1957	31	123	12	157	4	327
1958	20	28	—	140	—	188
1959	53	401	12	235	—	701
1960	62	397	16	267	—	742
1961	49	283	12	250	—	594

Number of Tuberculin Tests and B.C.G. Vaccination done in Schools

Year	Tuberculin Tests	B.C.G. Vaccination
1957	35,633	20,338
1958	17,466	9,790
1959	60,577	19,340
1960	69,339	23,029
1961	59,301	18,439

Case-Finding in Schools.—Active case-finding to detect tuberculosis in schools was continued. Cases with symptoms were as usual referred to the School Tuberculosis Clinic by School Health officers. X-ray examinations were done amongst the following:

- (a) Secondary school leavers;
- (b) Primary I and VI children reacting severely to tuberculin test;
- (c) school teachers;
- (d) other employees in schools and school canteens.

Out of 5,328 school children x-rayed, 68 cases of active post-primary tuberculosis and 1 case of Miliary tuberculosis were found. In addition there were 318 cases of active primary infection, 1,395 healed primary and 163 cases were under investigation.

Out of 2,169 school teachers examined radiologically, 64 active cases, 33 inactive and 29 cases of doubtful activity requiring investigation were discovered.

Of 1,198 school hawkers X-rayed, there were 48 active cases, 16 inactive and 29 cases of doubtful activity requiring investigation.

The statement below shows details of cases found:

			School Children	School Teachers	School Servants and Hawkers
Active Primary	...	...	318	2	—
Healed Primary	...	...	1,395	38	27
Miliary	...	...	1	—	—
Tuberculosis of Bone and Joints	...	...	8	—	—
Active Pulmonary Tuberculosis	...	...	68	64	48
Quiescent	...	...	17	33	16
Healed Pulmonary Tuberculosis	...	...	8	3	1
Under Investigation	...	...	163	29	29

All hawkers who were taken off work and had to remain off work for some time were transferred to the Tan Tock Seng Hospital for Social Welfare aid and treatment. With the exception of these, and such patients as had to be hospitalised, all other patients, both school children and school staff, on active treatment were treated at the School Tuberculosis Clinic at Institute of Health.

The table below shows the routine clinic attendance at the School Tuberculosis Clinic in 1961:

	School Children	School Teachers	School Servants and Hawkers	Total
New Cases	2,104	199	146	2,449
Re-visits	11,340	1,085	722	13,147
Total	13,444	1,284	868	15,596

Feeding Scheme.—The Feeding Scheme, started in April 1949 was continued. In 1961 the sum of \$22,000 was allowed under this scheme. New cases put on feeding during the year number 272. 7,500 lb. of vitaminised skimmed milk donated by UNICEF were also issued. The feeding was a fortnightly distribution of the following to undernourished children suffering from tuberculosis:

- (a) 1 lb. cream milk.
- $\frac{1}{2}$ lb. vitaminised skimmed milk.
- $\frac{1}{4}$ lb. ovaltine.
- (b) $\frac{1}{2}$ lb. fresh butter.
- (c) 6 eggs.
- (d) 6 oranges.
- (e) 1 lb. shelled peanuts.

This diet has been laid down by the Dietician, University of Singapore.

The following statement and table give an indication as to the number of persons catered for and the number of feeds distributed:

Statement				
Cases on feeds carried forward from December, 1960				184
New cases on feeds in 1961	...	...	...	272
				<hr/>
Total cases of feeds	...	...	...	456
Total cases taken off feeds	...	...	...	204
				<hr/>
Feeds carried forward to January, 1962	...	...	...	252
				<hr/>

Number of Distributions in 1961				
Age Group in years	1—5	6—10	11—15	Total
New Cases	34	160	78	272
Re-visits	673	3,159	1,537	5,369
Total	707	3,319	1,615	5,641

STATISTICS AND RECORDS

The annual mortality rate for pulmonary tuberculosis and tuberculosis of all forms per 100,000 of the population for the years 1957, 1958, 1959, 1960 and 1961 were as follows:

	1957	1958	1959	1960	1961
Tuberculosis of all forms	51.9	41.2	39.7	39.5	38.2*
Pulmonary tuberculosis	46.4	37.5	36.5	37.5	36.2*

* Provisional only.

Acknowledgement.—The opportunity is taken of acknowledging with grateful thanks the supply of free tuberculin and B.C.G. vaccine from Australia under the Colombo Plan aid from March to September 1961.

APPENDIX I

STATISTICAL TABLE

Year	Mean Population 1,000s	Notifications			Number on Register			Prevalence Per 100,000		Number Receiving T.B. Allowance	Deaths			Death Rate per 100,000	
		Pulm.	Ext. Pulm.	Total	Pulm.	Ext. Pulm.	Total	Pulm.	All Forms		Pulm.	Ext. Pulm.	Total	Pulm.	All Forms
1958 ..	1,515	2,078	1	2,079*	2,009	1	2,010	133	133	2,349	568	56	624	37.5	41.2
1959 ..	1,582	5,637	29	5,666	7,038	20	7,058	445	446	2,484	577	51	628	36.5	39.7
1960 ..	1,634	4,985	72	5,057	11,278	59	11,337	690	693	1,985	612	34	646	37.5	39.5
1961 ..	1,687	6,216	83	6,299	16,815	107	16,922	996	1,003	2,254	610	35	645†	36.2	38.2

* From August to December, 1958.

† Provisional only.

TUBERCULOSIS NOTIFICATIONS FOR THE YEAR, 1961

SHOWING FORM AND EXTENT OF DISEASE, RACE AND SEX

Form and Extent of Disease	CHINESE			MALAYSIANS			INDIANS AND PAKISTANIS			OTHERS			PERSONS		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Min. ..	1,598	546	2,144	167	43	210	123	9	132	20	3	23	1,908	601	2,509
Mod. ..	1,581	404	1,985	123	45	168	114	17	131	11	4	15	1,829	470	2,299
Adv. ..	644	162	806	71	18	89	46	12	58	3	3	6	764	195	959
Pleur. Effus. ..	27	15	42	4	4	8	10	1	11	..	..	..	41	20	61
Extra Pul. ..	42	22	64	5	2	7	5	5	10	..	2	2	52	31	83
Pulm. not stated ..	264	65	329	26	9	35	18	4	22	2	..	2	310	78	388
Total ..	4,156	1,214	5,370	396	121	517	316	48	364	36	12	48	4,904	1,395	6,299

TUBERCULOSIS NOTIFICATIONS FOR THE YEAR, 1961

SHOWING AGE, RACE AND SEX

Age Group in Years		CHINESE			MALAYSIANS			INDIANS AND PAKISTANIS			OTHERS			PERSONS		
		Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
0—4	..	14	8	22	3	4	7	2	2	4	..	1	1	19	15	34
5—9	..	11	7	18	1	1	2	..	..	..	..	..	..	12	8	20
10—14	..	23	22	45	3	3	6	1	1	2	..	..	..	27	26	53
15—19	..	172	86	258	15	6	21	10	5	15	1	..	1	198	97	295
20—24	..	371	114	485	36	22	58	16	10	26	4	1	5	427	147	574
25—29	..	321	113	434	46	17	63	23	9	32	4	2	6	394	141	535
30—34	..	392	143	535	49	15	64	46	5	51	1	1	2	488	164	652
35—39	..	339	117	456	55	18	73	38	2	40	4	1	5	436	138	574
40—44	..	412	136	548	42	15	57	49	5	54	9	1	10	512	157	669
45—49	..	454	131	585	36	8	44	41	3	44	3	2	5	534	144	678
50—54	..	490	115	605	46	4	50	40	1	41	5	..	5	581	120	701
55—59	..	461	78	539	30	2	32	25	3	28	3	2	5	519	85	604
60—64	..	384	68	452	17	2	19	13	1	14	1	..	1	415	71	486
65—69	..	204	54	258	10	3	13	6	..	6	1	1	2	221	58	279
70—74	..	87	13	100	2	..	2	2	1	3	..	..	..	91	14	105
75 and over ..	..	21	9	30	5	1	6	4	..	4	..	..	..	30	10	40
Total ..	..	4,156	1,214	5,370	396	121	517	316	48	364	36	12	48	4,904	1,395	6,299

SINGAPORE

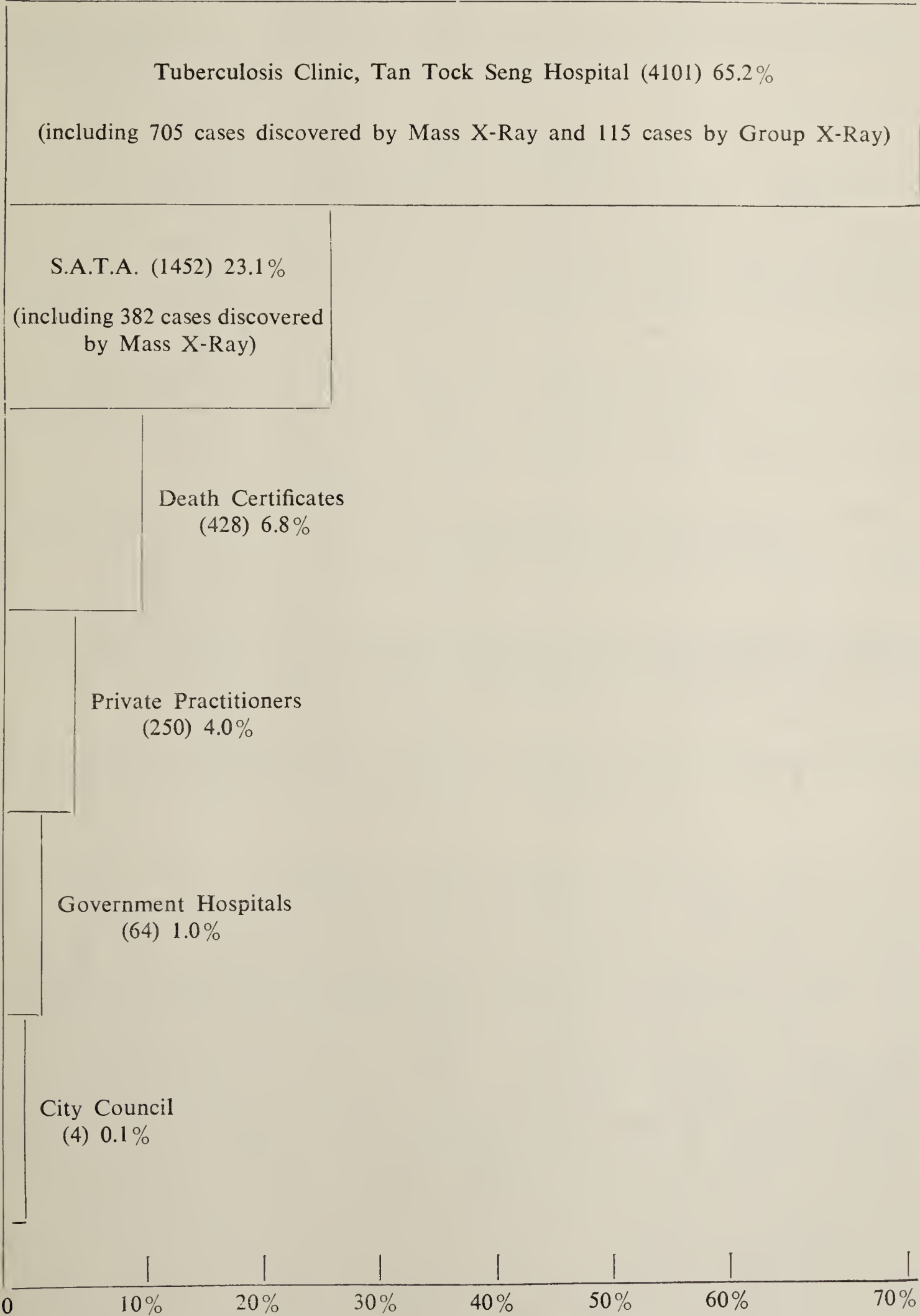
TUBERCULOSIS NOTIFICATIONS FOR THE YEAR, 1961

BY OCCUPATION, RACE AND SEX

Occupation	Code	CHINESE			MALAYSIANS			INDIANS AND PAKISTANIS			OTHERS			GRAND TOTAL		
		Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Professional, Technical and Related Occupation ..	0	79	13	92	9	2	11	3	..	3	5	1	6	96	16	112
Administrative, Executive and Managerial Occupations (Excluding those in Agriculture and Retail Trade) ..	1	16	..	16	1	..	1	4	..	4	1	..	1	22	..	22
Clerical Occupations ..	2	296	24	320	48	..	48	24	1	25	13	1	14	381	26	407
Sales and Related Occupations ..	3	757	24	781	18	2	20	45	..	45	2	..	2	822	26	848
Agricultural Occupations ..	4	88	5	93	10	..	10	..	..	..	..	..	..	98	5	103
Mines, Quarrying and Related Occupations ..	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Transport and Communication Occupations ..	6	393	6	399	80	..	80	22	..	22	2	2	4	497	8	505
Craftsmen, Production Process Workers and Labourers not elsewhere classified ..	7 and 8	997	81	1,078	80	1	81	96	..	96	1	..	1	1,174	82	1,256
Service, Sport, Entertainment and Recreation Occupations ..	9	191	62	253	42	1	43	34	..	34	1	..	1	268	63	331
PERSONS ECONOMICALLY ACTIVE																
Home Housework ..	55	5	863	868	1	104	105	..	45	45	..	6	6	6	1,018	1,024
Full Time Student ..	56	178	69	247	8	4	12	7	..	7	1	..	1	194	73	267
Inmates of Mental Hospitals and Penal Institutions	57	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Pensioners and Persons with Private Means ..	58	5	..	5	4	..	4	2	..	2	2	..	2	13	..	13
All Other Economically Inactive (e.g. 'Disabled', 'Too Old', 'Too Young', Inactive, etc.) ..	59	1,079	66	1,145	84	7	91	72	2	74	6	2	8	1,241	77	1,318
Occupation not stated ..	11.11	72	1	73	11	..	11	7	..	7	2	..	2	92	1	93
Total ..		4,156	1,214	5,370	396	121	517	316	48	364	36	12	48	4,904	1,395	6,299

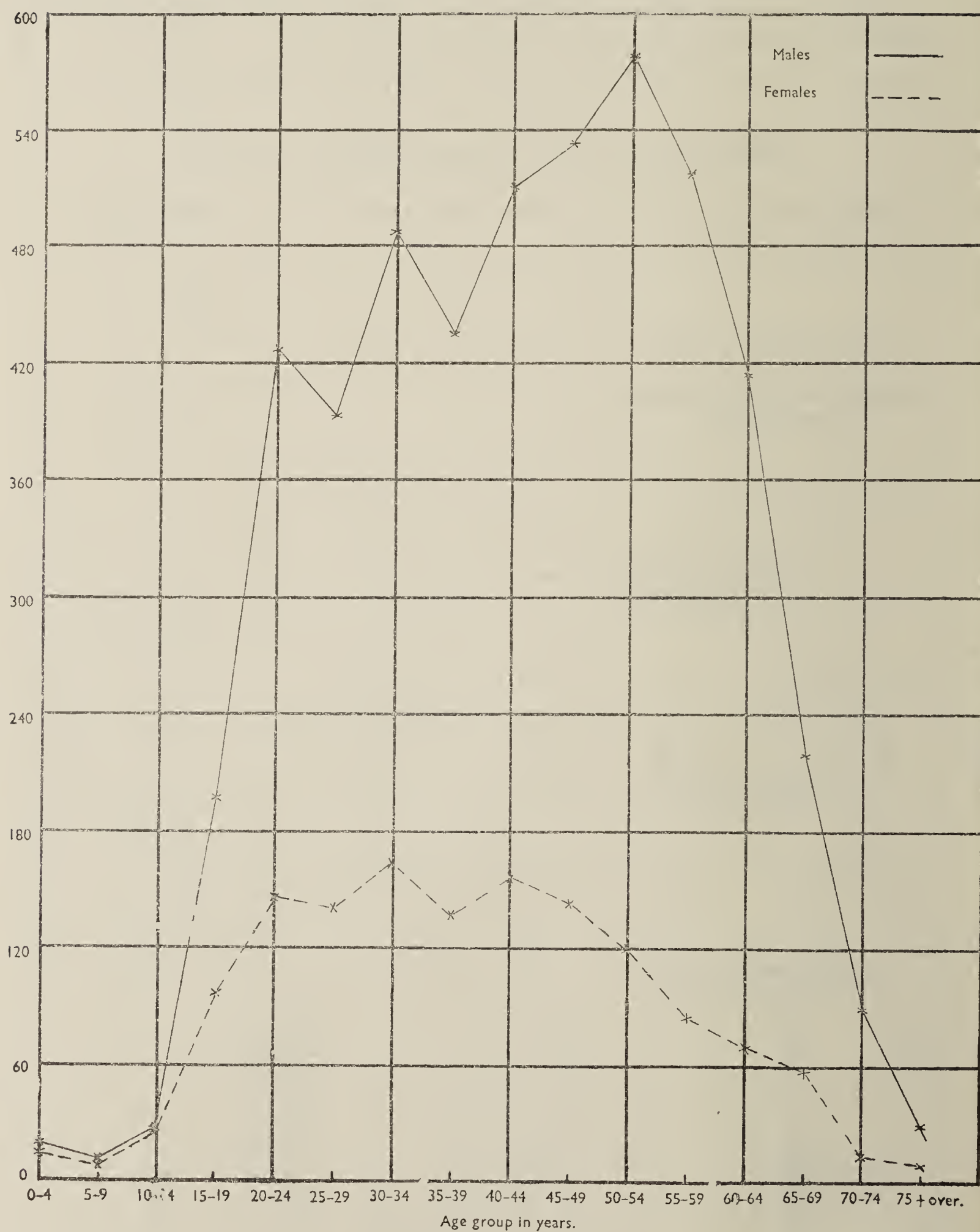
APPENDIX VI

Histogram showing the source of discovery of cases of tuberculosis as percentage of total notifications for the months January to December 1961.



As at 31st December, 1961, a total of 6,299 notifications was received.

GRAPH SHOWING AGE DISTRIBUTION OF TUBERCULOSIS CASES NOTIFIED IN 1961



Chapter Thirty-six

DEPARTMENT OF PATHOLOGY

STEADY expansion in the work of the Department of Pathology which has been a feature of each Annual Report continued in 1961.

The work of the Department includes:

- (1) necropsies (Coroner and hospital cases) at the General, Tan Tock Seng and Kandang Kerbau Hospitals;
- (2) histological examinations of biopsy and necropsy specimens from Government hospitals, clinics and general practitioners;
- (3) bacteriological investigations from the Government hospitals, clinics, dispensaries and private practitioners. This includes bacteriological investigations relating to Public Health conducted by City Bacteriological Laboratory which has been merged with the Department since 1960;
- (4) serological tests of blood and cerebro-spinal fluids from hospitals, clinics, dispensaries and private practitioners.
- (5) the preparations of T.A.B., cholera and autogenous vaccines for the use of the Government hospitals, clinics, dispensaries and private practitioners;
- (6) the carrying out of various clinical laboratory examinations of pregnancy and other miscellaneous examinations;
- (7) biochemical investigations for the Government hospitals and private practitioners;
- (8) training of all medical laboratory technicians in the Ministry of Health. This training is based on that of the Institute of Medical Technology, London. Examinations were carried out in 1961 under a Board of Examiners with the Senior Pathologist as Chairman (*ex-officio*);
- (9) Blood Transfusion Service in General Hospital which was placed under the organisation of the Department.

CHANGES IN DEPARTMENTAL ROUTINE

The serious staff shortage of experienced senior officers was eased by the arrival in April 1961 by specialists in pathology and bacteriology from Israel. Where previously there was delay in reporting on morbid histology, this was remedied and the reports were able to be sent out on schedule. The arrival of a qualified bacteriologist did much to boost the work of the Bacteriology Section. Many improvements in technique as well as a number of new investigations were introduced. The training of laboratory technicians was intensified and their interest in bacteriology stimulated by lectures as well as their participation in the preparation and reading of papers related to bacteriological subjects in a programme drawn up by the bacteriologist. Medical officers who were posted as trainees in the Department were coached in morbid histology in both necropsy and surgical biopsies by the pathologist from Israel. There has always been a decided reluctance on the part of the M.Os. to join the Department because of lack of experienced pathologists who could train them in morbid histology. It is hoped that the training so provided will serve as an incentive to future medical officers who would like to take up pathology as a career.

The Biochemical Section which has been showing steady increase in work is working under cramped conditions due to lack of adequate laboratory space. Action is being taken to utilise four rooms on the top floor of the present building at present vacant to house the Biochemical Laboratory.

TEACHING

The teaching of forensic medicine to medical students was carried out by Dr. B. Gallei.

TOTAL NUMBER OF YEARLY INVESTIGATIONS

	1954	1955	1956	1957	1958	1959	1960	1961
1. Necropsy ..	2,025	2,172	2,336	2,627	2,576	2,509	2,497	2,705
2. Histology ..	7,039	8,728	9,444	10,120	11,374	12,658	15,162	25,640
3a. Bacteriology	25,617	33,406	44,576	50,107	43,357	45,340	46,951	45,014
3b. City Bacteriology ..	..	..	..	..	..	..	74,196	74,860
4. Serology ..	58,011	74,200	74,196	71,746	72,347	77,776	80,130	78,104
5. Biochemistry ..	..	..	..	..	..	10,312	15,221	20,585
Total ..	94,614	128,932	156,526	164,148	162,038	180,089	234,157	246,908

The total number of examinations is 246,908 which includes 74,860 examinations done by the City Bacteriological Department.

STAFF

The Staff in the Department of Pathology comprise the following:

Senior Pathologist	...	...	Vacant. Dr. A. O. Aaron, L.M.S. Singapore 1938 (Acting).
Pathologist	...	...	Dr. A. O. Aaron, L.M.S. (Singapore).
Pathologist (Supernumerary)	...	...	Dr. B. Gallei, M.D. Bari (Italy) (on contract).
Bacteriologist (Supernumerary)	...	...	Dr. J. Stein, Ph.D., M.Sc. (on contract).
Bacteriologist (City Council)	...	...	Dr. (Mrs.) B. Stein, Ph.D., M.Sc.
Biochemist	...	...	Dr. P. C. Leong, Ph.D., A.R.I.C.
Senior Registrar	...	...	Dr. K. Sugai, M.D. (Tokyo) (on contract).
Medical Officers	...	...	Dr. Tan Kheng Khoo, M.B.B.S. (Adelaide) on Study leave in U.K. since August, 1960. Dr. N. R. Mitra, M.B.B.S. (Calcutta). Dr. Lim Kwang Hui, M.B.B.S. (Malaya). Dr. D. B. Wadhwani, M.B.B.S. (Bombay). Dr. B. R. Mukerjee, M.B.B.S. (Calcutta). Dr. L. S. da Silva, L.M.S. (Singapore), M.D. (Malaya), Dip. (Bact.) Manchester. On a sessional basis of 2 hours every morning.

Dr. Mukerjee (M.O.) who joined the Department on 17th January, 1961 left the Department on transfer from 24th March, 1961.

Dr. D. B. Wadhwani, M.O. resigned from the service on 20th January, 1961.

OTHER STAFF

- 1 Clerk (Re-employed pensioner) — Resigned on 27th March, 1961.
- 1 Clerical Officer — Resigned on 28th October, 1961.
- Stenographer (vacant).
- 1 Storekeeper.
- 22 Laboratory Technicians.
- 1 Typist.
- 23 Laboratory Attendants.
- 1 Office Boy.

The staff in the City Bacteriological Laboratory comprised the following:

Bacteriologist (Temporary) — Mrs. B. Stein, M.Sc. (on contract).

Assistant City Bacteriologist — Dr. K. Karunakaran, M.B.B.S. (Madras).

Laboratory Officer (vacant).

4 Laboratory Assistants.

4 Laboratory Attendants.

1 Clerk.

POST MORTEM EXAMINATION

Total number of Necropsies 2,705.

(1) Coroner's Cases 1,359.

These necropsies were conducted by the staff of the Government, Department of Pathology.

(2) Hospital Cases 1,346.

These necropsies were conducted by the staff of the University, Department of Pathology.

AGE, SEX AND RACE DISTRIBUTION OF AUTOPSIES ON ALL DEATHS

(Coroner's and Ward Cases)

1961.

Age	CHINESE		INDIANS		MALAYS		OTHERS		TOTAL		Grand Total
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
Under 1 year ..	565	460	24	23	4	..	1	3	595	486	1,081
1—10 years ..	154	122	6	1	2	4	2	1	164	128	292
11—20 years ..	72	27	6	1	3	2	1	..	82	30	112
21—30 years ..	90	30	9	7	7	3	2	..	108	40	148
31—40 years ..	75	32	29	2	4	1	4	2	112	37	149
41—50 years ..	122	55	57	..	6	3	5	1	189	59	248
51—60 years ..	216	64	25	4	6	1	8	1	255	70	325
61—70 years ..	163	51	8	2	1	1	1	1	173	55	228
Over 71 years ..	53	30	5	..	..	..	..	1	58	31	89
Total ..	1,510	871	169	40	33	15	24	10	1,736	936	2,672

Autopsies of Unknown Cases .. 33

Total .. 2,705

A comparison of certain causes of death established by Post Mortem Examination in 1961 with corresponding figures since 1957.

	1957	1958	1959	1960	1961
Tuberculosis	124	83	55	52	62
Cerebral Haemorrhage and Hypertension	51	86	27	33	90
Coronary Disease	85	73	94	107	85
Cardiovascular Syphilis	19	31	14	22	24
Malaria	1	..	1	..	..
Beri Beri	11	21	18	21	8
Amoebiasis	4	3	7	4	10
Bacillary Dysentery	3	6	2	2	1
Typhoid .. ..	..	3	1	3	2
Diphtheria	3	4	6	2	3
Lobar Pneumonia	45	39	28	50	13
Malignant Tumours	113	91	119	106	133

An Analysis of the Main Causes of Death in Coroner's Cases for 1961 and the preceeding 4 years.

Year	1957	1958	1959	1960	1961
Total Necropsies	2,627	2,576	2,509	2,497	2,705
Coroner's Cases	1,255	1,170	1,229	1,179	1,259
Injuries from Cutting and Piercing Instruments	21	29	43	37	45
Injuries by Blunt Instrument ..	10	15	19	12	13
Injuries by Firearms	7	5	7	3	5
Hanging	77	58	80	71	73
Drowning	68	67	81	39	57
Caustic Soda Poisoning	28	13	19	11	11
Malathion Poisoning .. ..	..	..	..	..	4
Other Forms of Poisoning ..	16	21	23	13	18
Vehicle Accidents	162	194	191	154	188
Other Forms of Violences and Un-natural Deaths	152	159	219	189	233
Death from all forms of Violence Un-natural causes	541	561	682	529	647

MEDICO-LEGAL-RETURNS

Total No. of Cases	...	...	...	...	129
(1) Bacteriological Examinations	...	...	...	...	215
(2) Wasserman Test	...	...	...	...	3
(3) Kahn Test	...	...	...	...	4
(4) V.D.R.L.	...	...	...	...	4
(5) G.C.F.T.	...	...	...	...	3
(6) Toad's Test	...	...	...	...	9
(7) Bones	...	...	...	...	4
(8) Corpse	...	...	...	...	7
(9) Finger Nail Clippings	...	...	...	...	1
(10) Human Organs (Histological Examinations)	...	...	...	...	8
(11) Cloth	...	...	...	...	1
(12) Knickers	...	...	...	...	2
(13) Urine	...	...	...	...	1

HISTOLOGY

Total number of sections	...	...	...	25,640
1. <i>Sections from Biopsies:</i>				
(a) Total number of cases	...	...	8,887	
*(b) Total number of tissues	...	...	10,422	
(c) Total number of sections	...	...	19,958	
2. <i>Sections from Necropsies:</i>				
(a) Total number of cases	...	...	1,247	
(b) Total number of sections	...	...	5,682	

* (Including 370 Cytological examinations).

AN ANALYSIS OF THE HISTOLOGICAL DIAGNOSIS

1. Inflammatory	...	...	...	2,538
2. Tuberculosis	...	...	...	158
3. Benign Tumours	...	...	...	993
4. <i>Malignant Tumours:</i>				
(a) Nasopharynx	...	...	...	152
(b) Cervix	...	...	...	110
(c) Oesophagus	...	...	...	67
(d) Colon and Rectum	...	...	...	63
(e) Skin	...	...	...	102
(f) Breast	...	...	...	54
(g) Stomach	...	...	...	84
(h) Others	...	...	...	899
		Total	...	1,531
5. Others	...	...	...	5,202

Total ... 10,422

ANALYSIS OF TISSUES EXAMINED

1.	Anal and Ischio-rectal tissues	...	...	...	187
2.	Animal Tissues	...	...	...	9
3.	Appendix	...	...	...	880
4.	Ascitic fluid	...	...	...	50
5.	Adrenals	...	...	...	6
6.	Bladder	...	...	...	55
7.	Blood vessels	...	...	...	19
8.	Bones	...	...	...	147
9.	Bone Marrow	...	...	...	6
10.	Brain and Meninges	...	...	...	31
11.	Breast	...	...	...	238
12.	Bronchus	...	...	...	51
13.	Bronchial smears	...	...	...	20
14.	Blood films (Sex determination)	...	...	...	29
15.	Cervix	...	...	...	1,068
16.	Colon and Rectum	...	...	...	101
17.	Conjunctive and Cornea	...	...	...	6
18.	Ear	...	...	...	69
19.	Endometrium	...	...	...	1,917
20.	Eye and Eyelids, etc.	...	...	...	48
21.	Fallopian tube	...	...	...	245
22.	Gall bladder and common bile duct	...	...	...	122
23.	Heart muscle and pericardial fluid	...	...	...	26
24.	Intestines	...	...	...	69
25.	Joints and Synovial tissues	...	...	...	79
26.	Kidney	...	...	...	88
27.	Larynx	...	...	...	122
28.	Liver	...	...	...	232
29.	Lung	...	...	...	91
30.	Lymph gland	...	...	...	504
31.	Mastoid Antrum	...	...	...	7
32.	Mesentery	...	...	...	5
33.	Muscles	...	...	...	17
34.	Mouth and Dental Diseases	...	...	...	39
35.	Mediastinum	...	...	...	5
36.	Nerves and Sympathetic ganglia	...	...	...	39
37.	Nose and Nasopharynx and sinuses	...	...	...	360
38.	Oesophagus	...	...	...	112
39.	Omentum	...	...	...	37
40.	Ovary	...	...	...	383
41.	Oral Smears	...	...	...	15
42.	Palate	...	...	...	16
43.	Pancreas	...	...	...	13
44.	Pus	...	...	...	4
45.	Parathyroid	...	...	...	1
46.	Penis	...	...	...	29
47.	Peritoneum and Peritoneal fluid	...	...	...	20
48.	Pharynx	...	...	...	9

BACTERIOLOGY SECTION

LAB. I and II (Routine)

Total number of Bacteriological Investigations	...	...	45,014
1. <i>Throat and Nasal swabs for culture</i>	...	...	6,691
Beta streptococcus isolated	...	256	
<i>C. diphtheriæ</i> isolated	...	191	
Staphylococcus aureus isolated	...	987	
Other pathogenic organisms isolated	...	402	
2. <i>Sputum for Culture</i>	...	...	2,158
Pathogenic organisms isolated	...	582	
3. <i>Pus and Ear Swabs, etc.</i>	...	...	3,955
Pathogenic organisms isolated	...	2,619	
4. <i>Pleural and other fluids</i>	...	...	528
Pathogenic organisms isolated	...	70	
5. <i>Blood for culture</i>	...	...	1,710
Staphylococcus aureus isolated	...	41	
Salmonella typhi isolated	...	35	
Alpha streptococcus isolated	...	26	
Beta streptococcus isolated	...	4	
<i>H. para-influenzæ</i> isolated	...	2	
<i>Ps. pyocyanea</i> isolated	...	15	
Other pathogenic organisms isolated	...	35	
6. <i>Cerebral Spinal fluid for Culture</i>	...	...	792
<i>H. influenzae</i> isolated	...	6	
Cryptococcus neoformans isolated	...	13	
Meningococcus isolated	...	3	
Staphylococcus aureus isolated	...	5	
Pneumococcus isolated	...	28	
Histoplasma capsulatus (P.M.) isolated	...	1	
Beta streptococcus isolated	...	2	
Other pathogenic organisms isolated	...	3	
7. <i>Urethral, Vaginal and Cervical Swabs</i>	...	...	1,523
Staphylococcus aureus isolated	...	155	
Beta streptococcus isolated	...	97	
Alpha streptococcus isolated	...	50	
<i>Cl. welchii</i> isolated	...	9	
<i>Ps. pyocyanea</i> isolated	...	15	
<i>B. proteus</i> isolated	...	29	
Candida sp. isolated	...	20	
<i>N. gonorrhoeæ</i> isolated	...	7	
Other pathogenic organisms isolated	...	7	

BACTERIOLOGY SECTION — *continued*

LAB. I and II (Routine)

8.	<i>Eye Swabs for culture</i>	...	...	...	...	247
	H-influenzæ isolated	...	...	...	2	
	Staphylococcus aureus isolated	...	...	...	49	
	Beta streptococcus isolated	...	...	...	4	
	Alpha streptococcus isolated	...	...	...	5	
	N. gonorrhoeæ isolated	...	...	...	2	
	Ps. pyocyanea isolated	...	...	...	11	
	Other pathogenic organisms isolated	...	...	...	7	
9.	<i>Urine for culture</i>	...	...	...	...	3,524
	Staphylococcus aureus isolated	...	...	...	92	
	B. proteus isolated	...	...	...	325	
	Ps. pyocyanea isolated	...	...	...	123	
	Entrococcus isolated	...	...	...	201	
	Alpha streptococcus isolated	...	...	...	46	
	B. coli isolated	...	...	...	539	
	B. ærogenes isolated	...	...	...	385	
	S. typhi isolated	...	...	...	5	
10.	<i>Stool and Rectal Swabs for culture</i>	...	...	...	...	4,041
	Pathogenic coli isolated	...	...	...	299	
	Salmonella group isolated	...	...	...	23	
	Shigella group isolated	...	...	...	26	
	Candida sp. isolated	...	...	...	93	
11.	Agglutination Tests (Widal and Weil Felix)	...	...	...	...	1,653
12.	Agglutination Tests for glandular fever (Paul Brunnell Test)	...	...	...	...	44
13.	<i>Blood Clot for culture</i>	...	...	...	...	1,653
	Salmonella typhi isolated	...	...	...	46	
14.	Specimens for mycological Investigations	...	...	...	...	105
	Candida albicans isolated	...	...	...	10	
	Candida tropicalis isolated	...	...	...	14	
	Histoplasma capsulatus isolated	...	...	...	1	
	Cryptococcus neoformans isolated	...	...	...	7	
	Actinomyces Israeli isolated	...	...	...	2	
	Trichophy for schoenleini isolated	...	...	...	2	
	Trichophy for rubrum isolated	...	...	...	1	
	Tinea Vesicolor isolated	...	...	...	1	
	Aspergillus sp. isolated	...	...	...	4	
	Penicillin sp. isolated	...	...	...	6	
	Microsporum canis isolated	...	...	...	1	
15.	Anti-biotic Sensitivity Examinations	...	...	...	...	12,496

BACTERIOLOGY LAB. III
(Miscellaneous)

I. Media Preparation :

						c.c.
Agar Media	...	...	...	...	...	2,750,000
Broth Media	...	...	...	...	...	1,250,000
Egg Media	...	...	...	...	...	40,000
Meat Media	...	...	...	...	...	30,000
Serum Media	...	...	...	...	...	48,000
Sugars Media (Lactose, Succharose, Maltose, Mannite, Dulcitate, Xylose, Inulin, Dextrin and Starch)	...	...	...	...	...	65,000
Physiological Saline	...	...	...	...	...	550,000

II. Vaccine Preparation :

Autogenous Vaccine	...	...	...	...	80
T.A.B. (Prophylatic)	...	...	...	...	42,300
Cholera Vaccine	...	...	...	...	338,300

III. Preparation of Agglutinable Suspensions :

B. Typhosus 'H'	...	...	...	...	6,000
B. Typhosus 'O' (concentrated)	...	...	...	...	410
B. Typhosus 'Vi' (concentrated)	...	...	...	...	200
B. Para typhosus A 'H'	...	...	...	...	6,000
B. Para typhosus B 'H'	...	...	...	...	1,500
B. Para typhosus B 'O' (concentrated)	...	...	...	...	400
B. Para typhosus C 'H'	...	...	...	...	1,500
B. Para typhosus C 'O'	...	...	...	...	400

IV. Miscellaneous Tests :

						Cases
1. Toad Test (For pregnancy)	...	...	...	...	...	316
Positive	Negative		Inconclusive			
116	197		3			
2. Sterility Tests	...	...	...	...	...	949
Biological Solution	...	...	...	...	890	
Bones (from Bone Bank)	...	...	...	...	59	
3. Anti biotic Assays and Bacteriocidal tests	...	...	...	...	...	6
4. Blood Tests for Leptospirosis	...	...	...	...	...	333
(a) SEL tests	...	...	...	...	327	
Negative	Positive					
1/25	1/25	1/100	1/400	1/1600	1/6400 or more	
184	39	36	32	17	19	
(b) Agglutination	...	...	...	...	6	
5. Culture for Leptospirosis	...	...	...	...	...	296
Specimen	Total		Positive	Negative		
Blood clot (after SEL)	287		1	286		
Blood culture	7		—	7		
Urine	2		—	2		

IV. Miscellaneous Tests — *continued*

V. Culture for Amoeba						1,223
<i>Specimen</i>	<i>Total</i>	<i>Positive ME Troph or cyst</i>	<i>Positive culture E. hist.</i>	<i>E. Coli.</i>	<i>E. nana</i>	
Stool	1,127	37	77	2	9	
Rectal swabs	21	—	1	—	—	
Pus from liver and other sources	68	—	3	—	—	
P.M. specimens	3	—	1	—	—	
Miscellaneous	4	—	—	—	—	
Trichomonas homonis grown from stool culture = 32.						

BACTERIOLOGY LAB. III — *continued*
(Miscellaneous)

VI. Maintenance of Stock Cultures	...	...	...	...	176
Leptospira	...	...	...	...	10
M. tuberculosis	...	...	...	...	4
C. diphtheriae	...	...	...	...	3
E. histolytica	...	...	...	...	4
V. Cholera	...	...	...	...	6
Fungi	...	...	...	...	17
Pathogenic coli	...	...	...	...	2
Shigella, Salmonella, Clostridium, Brucella, etc.	...	...	...	...	130
VII. Staff:					
Bacteriologist — Dr. Stein.					
Senior Laboratory Technician i/c:	...	...	...	...	1
Qualified Laboratory Technicians	...	...	...	...	6
Laboratory Technicians in training	...	...	...	...	6
Laboratory Attendants	...	...	...	...	12

Remarks:

1. More mycological investigations were carried out and many pathogenic fungi were identified.
2. Many new selective media and new methods of investigation were introduced in bacteriology.
3. The following new tests were introduced towards the end of 1961:—
 - (a) C-reactive protein Tests.
 - (b) Anti-streptolysin 'O' titre.
 - (c) Agar plate precipitation Test for virulence of K.L.B.
4. This section had prepared a stock of 300,000 doses of Cholera Vaccine at short notice at the request of the Government for mass inoculation as precaution against a possible outbreak of cholera during the cholera epidemic in the neighbouring countries.

DEPARTMENT OF PATHOLOGY SEROLOGY

Total number of tests performed during the year = 78,104.

Blood Examination

V.D.R.L. Test (Qualitative)	...	...	...	...	58,604
Kahn Test (Qualitative)	...	...	...	...	11,041
Kahn Test (Quantitative)	...	...	...	...	89
Wasserman Reaction	...	...	...	...	3,630
Gonococcus Complement Fixation Test	...	...	...	...	707
Filarial Complement Fixation Test	...	...	...	...	550
Waler and Rose Reaction for Rheumatoid Factor	...	...	...	...	15
				Total	74,636

C.S.F. Examination

V.D.R.L. (Qualitative)	...	...	...	...	1,638
Kahn Test (Qualitative)	...	...	...	...	1,475
Wassermann Reaction	...	...	...	...	74
Langes Colloidal Gold Curve	...	...	...	...	281
				Total	3,468

Month	V.D.R.L.				KAHN TEST				KT. (Q)	WASSERMANN REACTION					G.C.F.T.				
	Positive	Doubtful	Negative	Total	Positive	Doubtful	Negative	Total	Total	Positive	Doubtful	Negative	A.C.	Total	Positive	Doubtful	Negative	A.C.	Total
January ..	104	189	4,552	4,845	100	133	564	797	3	82	48	132	..	262	4	6	22	..	32
February ..	107	144	3,869	4,120	104	120	496	720	3	81	46	107	1	235	4	8	23	1	36
March ..	123	174	4,508	4,805	115	140	497	752	3	81	76	139	..	296	7	7	35	2	51
April ..	125	197	3,930	4,252	122	161	509	792	1	102	74	91	1	268	6	4	17	2	29
May ..	115	226	4,842	5,183	114	187	591	892	0	93	81	137	1	312	10	10	25	2	47
June ..	111	198	4,832	5,141	95	162	747	1,004	6	111	50	134	2	297	10	7	23	2	42
July ..	129	185	5,050	5,364	109	146	795	1,050	5	106	53	148	..	307	11	11	37	4	63
August ..	156	217	4,947	5,320	140	166	771	1,077	36	130	81	163	6	380	17	23	31	10	81
September ..	103	234	4,836	5,173	104	184	744	1,032	9	103	83	175	1	362	15	22	48	1	86
October ..	128	170	4,879	5,177	120	147	699	966	2	96	60	148	1	305	7	14	46	2	69
November ..	109	189	4,301	4,599	109	138	707	954	4	103	54	144	2	303	20	14	36	2	72
December ..	97	188	4,340	4,625	95	163	747	1,005	7	90	69	138	6	303	22	11	61	5	99
Total ..	1,407	2,311	54,886	58,604	1,327	1,847	7,867	11,041	89	1,178	775	1,656	21	3,630	133	137	404	33	707

DEPARTMENT OF PATHOLOGY SEROLOGY
(C.S.F.)

SINGAPORE

Month	V.D.R.L.				KAHN TEST				WASSERMANN REACTION					COLLOI- DAL GOLD
	Positive	Doubtful	Negative	Total	Positive	Doubtful	Negative	Total	Positive	Doubtful	Negative	A.C.	Total	Total
January ..	11	3	152	166	6	3	142	151	3	6	9	2	20	32
February ..	3	1	85	89	2	2	78	82	1	2	6	3	12	16
March ..	13	3	151	167	12	1	123	136	4	0	18	1	23	41
April ..	9	2	127	138	7	0	113	120	1	0	0	5	6	33
May ..	4	0	105	109	1	2	92	95	2	0	3	2	7	29
June ..	11	1	116	128	10	2	111	123	1	1	1	0	3	32
July ..	8	1	104	113	7	2	90	99	..	..	..	..	..	31
August ..	15	2	121	138	15	1	107	123	..	..	..	..	..	28
September ..	10	7	131	148	8	5	125	138	..	..	..	..	..	30
October ..	10	1	133	144	8	1	119	128	..	..	..	..	..	20
November ..	10	..	137	147	6	3	131	140	1	..	1	..	2	16
December ..	8	2	141	151	8	1	131	140	..	..	1	..	1	33
Total ..	112	23	1,503	1,638	90	23	1,362	1,475	13	9	39	13	74	281

BIOCHEMISTRY SECTION

The total number of analysis carried out was 20,585.

Blood:

potassium	...	...	...	...	...	5,108
sodium	...	...	...	...	...	5,088
chlorides	...	...	...	...	...	5,069
electrophoresis of serum protein	...	...	...	...	...	596
calcium	...	...	...	...	...	527
bilirubin	...	...	...	...	...	82
inorganic phosphorus	...	...	...	...	...	394
abnormal blood pigments	...	...	...	...	...	127
alkali reserve	...	...	...	...	...	83
alkaline phosphatase	...	...	...	...	...	106
creatinine	...	...	...	...	...	123
transaminase (S.G.O.T.)	...	...	...	...	...	552
transaminase (S.G.P.T.)	...	...	...	...	...	186
pyruvic acid	...	...	...	...	...	235
acid phosphatase	...	...	...	...	...	23
cholesterol	...	...	...	...	...	346
methæmoglobin	...	...	...	...	...	255
total lipids	...	...	...	...	...	53
iron	...	...	...	...	...	27
para-amino salicylic acid	...	...	...	...	...	33

Urine:

inorganic phosphorus	...	...	...	...	...	89
17-ketosteroids	...	...	...	...	...	132
creatinine	...	...	...	...	...	217
hæmoglobin	...	...	...	...	...	64
methæmoglobin	...	...	...	...	...	64
calcium	...	...	...	...	...	58
amino-acids	...	...	...	...	...	15
sodium	...	...	...	...	...	172
potassium	...	...	...	...	...	175
chlorides	...	...	...	...	...	163
17-ketogenicsteroids	...	...	...	...	...	82
total nitrogen	...	...	...	...	...	23
urea	...	...	...	...	...	14
coproporphyrin	12
5-hydroxy-indole-acetic acid	54
catecholamines	10

Fæces:

fat	41
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The following miscellaneous tests were also carried out:—

Blood: glucose, vitamin C, urea, thymol turbidity, creatine, uric acid, bromide, cæruloplasmin, magnesium, non-protein nitrogen, electrophoresis of rat serum, total serum nitrogen, copper, vitamin A.

Urine: vitamin C, paper chromatography, creatine, glucose, nature of sugars, protein, porphyrin, bilirubin, Bence Jones protein, protein electrophoresis, urobilinogen, Sulkowich's test, coproporphyrin, uroporphyrin, porphobilinogen, riboflavin, copper, iodine, phenylpyruvic acid, melanogen, ammonia nitrogen, pH.

Fæces: urobilinogen, trypsin, lactic acid.

Chemical Analysis: gastric contents, and calculi.

BACTERIOLOGICAL DEPARTMENT

The following is the report on the work done in the Bacteriological Laboratory, City Hall, during the year 1961.

Public Health Specimens:

			1960	1961
1.	Assistant Health Officer } M. O. i/c Staff }	... ..	10,952	8,390
2.	M. O. i/c O.D. Dispensaries	... ..	376	333
3.	City Cleansing Department	... ..	35	30
4.	City Sewerage Department	... ..	32	33
5.	Maternity and Infant Welfare Clinics and Creches		10,136	6,128
6.	Middleton Hospital	... ..	23,554	26,968
6a.	Special Test for grouping and Virulence.			
	Grouping = 6,500 } Virulence = 590 }	... ..	—	7,090
7.	Johore and Tebrau Water Works	... ..	187	194
8.	Private Practitioners	... ..	1,985	2,445
9.	Others (includes Cold Storage Creameries Ltd., and other Manufacturers, etc.)	... ..	60	60
9a.	Confirmative Coli test	... ..	—	50
10.	Rats from Plague Prevention Department	... ..	4,022	3,213
11.	Ecto-parasites from Plague Prevention Dept.	... ..	4,538	2,637
	Total	... ..	55,877	57,571

Water Samples:

12.	City Water Engineer	... ..	12,881	11,636
13.	City Council Swimming Pools	... ..	4,908	4,617
14.	Miscellaneous Sources	... ..	414	426
15.	Algae and other specimens	... ..	116	110
16.	Coli confirmative tests	... ..	—	500
	Total	... ..	74,196	74,860

Malaria.—375 blood films were examined for malarial parasites.

P. Vivax	... ..	2
Negative	... ..	373
Total	... ..	375

Tuberculosis.—1,674 specimens were examined.

			Positive	Negative	Total
1.	Sputum	... ..	16	1,577	1,593
2.	Fæces	... ..	—	1	1
3.	Urine	... ..	—	2	2
4.	Milk	... ..	—	78	78
	Total	... ..	16	1,658	1,674

Enteric Fever.—740 blood specimens were examined.

	Positive	Negative	Total
Agglutination with Sal. typhi ...	110	626	736
Sal. paratyphoid A. ...	1	322	323
Sal. paratyphoid B. ...	9	314	323
Sal. paratyphoid C. ...	13	310	323
Blood clot culture — Sal. typhi. ...	58	—	—
Sal. paratyphi A. ...	1	267	326
Fæces culture — Sal. typhi ...	159	—	—
Sal. paratyphi C. ...	3	1,618	1,780
Urine culture — Sal. typhi ...	40	1,573	1,613
	394	5,030	5,424
Agglutination with Vi antigen ...			739
Total ...	394	5,030	6,163

Typhus (Weil Felix Reaction):.

	Positive	Negative	Total
Agglutination with OXK. ...	—	318	318
Agglutination with OX19 ...	2	316	318
Grand Total ...			6,799

Special confirmative tests done = 6,799.

Dysenteries.—2,559 specimens of fæces were examined for *Amoebæ*.

E. histolytica were present in ...	13
Negative ...	2,546
Total ...	2,559

2,239 specimens of fæces were cultured.

S. flexner were isolated in ...	130 specimens
S. sonnei were isolated in ...	66 specimens
Negative ...	2,043
Total ...	2,239

Special confirmative tests done = 6,717.

Cholera.—13 specimens of fæces were examined and all were negative for *V. Cholerae*.

Diphtheria.—12,618 specimens of throat swabs, nasal swabs, eye swabs, ear swabs, sore swabs, etc. were examined.

Positives ...	1,471
Negatives ...	11,147
Total ...	12,618

Special test for grouping and virulence were carried out.

Grouping ...	6,500	} 7,090 specimens.
Virulence ...	590	

Leprosy.—6 specimens of smears were examined and all were negative.

Fæces for Ova and Intestinal Parasites.—7,232 specimens of fæces were examined. 4,507 specimens were negative and in 2,725 specimens ova present. There were two or three types of ova in a single specimen. Types of ova or intestinal parasites found in the specimens of fæces were:

Ankylostome	...	...	614
Ascaris	...	...	1,524
Trichuris	...	...	1,430
Strongyloides	...	...	3
Oxyuris	...	...	15
Lambliia cysts	...	...	11
Cercomonas	...	...	4

Miscellaneous Examinations:

		Positive	Negative	Total
1. Urine and Pus for Gonococci	...	38	419	457
2. Blood for Kahn Reaction	...	3	1,106	1,109
3. Fæces for occult blood	...		4	4
4. Blood for Filaria	...		7	7
5. Blood for Total Red Cell Count	...			15
6. Blood for Total White Cell Count	...			402
7. Blood for Differential Count	...			420
8. Blood for Hæmoglobin estimation	...			31
9. Blood for B.S.R.	...			8
10. Pathological exudates for General Examination	...			6
11. Urine for General Examination	...			2,329
12. Ice Cream, Popsicles, etc.	...			418
13. Condensed Milk, tinned	...			16
14. Milk and milk products	...			133
15. Bottles for sterility tests	...			23
16. Carbonated and Non-carbonated Drinks	...			10
17. Syrup	...			2
18. Corned Beef, tinned	...			5
19. Sundried Humus and Sludge	...			33
20. Wash water from Nightsoil	...			30
21. Disinfectant	...			19
22. Waste Materials from Aircrafts	...			9
23. Water for Pathogenic organisms	...			12

Confirmative tests for coli were carried out, involving 50 specimens of milk and milk products.

Plague.—3,213 rats were dissected and none showed any signs of plague infection.

2,637 ecto-parasites were combed from the rats and were examined.

The species and distribution of the rats and ectoparasites are given in the attached table.

There were no human specimens.

Water Samples:

Source			Annual Average total colonies per ml. at 37°C in 24 hours	Annual Average presumptive coliform counts per 100 ml. at 37°C in 24 hours
1.	MacRitchie Res. Valve Tower	...	259	62
2.	Peirce Res. Valve Tower	...	416	53
3.	Seletar Res. Suction Well	...	299	56
4.	Pontian Res. Valve Tower	...	344	79
5.	Pontian Camp Supply	...	17	1
6.	Tebrau Res. Clear Water Tank	...	8	0
7.	Gunong Pulai Res. Clear Water Tank	...	9	Less than 1
8.	Woodleigh Res. Clear Water Tank	...	10	0
9.	Bukit Timah Res. Clear Water Tank	...	14	Less than 1
10.	Bedok Res. Clear Water Tank	...	17	Less than 1
11.	Pearl's Hill Res. Tank No. 1	...	7	0
12.	Pearl's Hill Res. Tank No. 2	...	7	0
13.	Fort Canning Service Reservoir	...	7	Less than 1
14.	Taps — Bacteriological Laboratory		8	0
	Lorong Lalat Office	...	11	Less than 1
	Havelock Road Office	...	8	Less than 1
	Pasir Panjang Office	...	12	Less than 1
	Dunearn Road Office	...	7	Less than 1
	Joo Chiat Office	...	9	Less than 1
	Average of six (6) Taps	...	9	Less than 1

Public Swimming Pools (City Council)

Mount Emily —

Inlet End.	...	...	5	Less than 1
Outlet End.	...	...	5	Less than 1

Yan Kit —

Shallow Pool	...	...	7	Less than 1
Practice Pool	...	...	8	Less than 1
Main Pool (Inlet)	...	...	7	Less than 1
Main Pool (Outlet)	...	...	8	Less than 1

Farrer Park —

Shallow Pool (Inlet)	...	...	6	0
Shallow Pool (Outlet)	...	...	11	Less than 1
Main Pool (Inlet)	...	...	7	Less than 1
Main Pool (Outlet)	...	...	10	Less than 1

River Valley —

Shallow Pool (Inlet)	...	...	8	Less than 1
Shallow Pool (Outlet)	...	...	8	Less than 1
Main Pool (Inlet)	...	...	9	Less than 1
Main Pool (Outlet)	...	...	10	Less than 1

Miscellaneous Samples:

Singapore Swimming Club	...	...	207 samples
Tanglin Club	...	...	72 samples
Chinese Swimming Club	...	...	51 samples
Connell House	}	...	96 samples
Island Golf Club			
Others			

Total ... 426 samples

Algæ.—110 samples of water were examined for *Algæ* Coli confirmative test were carried out involving 500 samples. Tap water remained Satisfactory throughout the year 1961.

Staff.—Dr. B. Stein was appointed from 5th June, 1961 as the City Bacteriologist.

Dr. K. Karunakaran, Assistant Bacteriologist, acted as Medical Superintendent, Middleton Hospital on 28th April, 1961 and has not yet returned to this Department.

Mr. Lim Toh Nee, Laboratory Officer, resigned as from 29th June, 1961 giving three months notice. He proceeded on leave prior to resignation on 7th April, 1961.

Mr. Joseph Yeo Eng Kee acted as Laboratory Officer since Mr. Lim Toh Nee's absence.

During the second half of 1961 many more examinations were carried out. Over 500 *B. coli* confirmatory test (in addition to the coli-presumptive tests) and over 7,090 grouping and virulence test for diphtheria were carried out.

Antibiotic tests were also introduced and many such tests were carried out.

Fortunately, this was possible because there was not the normal amount of specimens as in the previous year, for reason like water shortage, strikes, etc. Should the number of specimens return to normal, it will not be possible to maintain the work on the same standard. This is because of shortage of staff.

SPECIAL INVESTIGATIONS ON DIPHTHERIA

In the second half of the year commencing from July, many diphtheria strains were examined for grouping and virulence tests.

694 such positive cultures yielded 14 per cent Gravis strains, 15 per cent Intermedius strains, and 71 per cent Mitis strains.

This work involved the preparation of 7,090 extra diagnostic culture tests. 378 of this strains were also examined for their virulence test.

The virulence tests on animals were carried out in collaboration with the bacteriological laboratory of the General Hospital.

35 rabbits were used for this purpose. At the same time the Agar-Gel diffusion method of Elek was employed for virulence test in vitro. This test was carried out in the City Council Bacteriological Laboratory in parallel to the animal tests and proved to be very satisfactory.

The Agar-Gel diffusion test has been now introduced as a routine procedure in the City Council bacteriological laboratory.

The investigation into the virulence test of the diphtheria strains revealed the following: 69 per cent Gravis strains, 60 per cent Intermedius strains and 78 per cent Mitis strains.

During this investigations it was also found that a single Loefflers Medium looks about 3 per cent of the positive cultures to be missed. Therefore the introduction of the tellurite medium as a supplement will enable us to recover the 3 per cent positive cases which were lost.

PLAGUE PREVENTION

THE FOLLOWING IS A RETURN OF RATS CAUGHT FOR THE YEAR 1961
(Bacteriological Laboratory, Singapore City Council 17th January)

Source	R Norvegicus		R Rattus		R Concolor		M. Musculus		Croci- dura	Total Rats	Total Preg- nant Rats	Total Dead Rats	Fleas X. Cheo- pies	Fleas others	Total Fleas	Mite	T. Lewisi		Aver- age Fleas per rat	Remarks
	M.	F.	M.	F.	M.	F.	M.	F.									+ve	-ve		
City Health ..	759	1,060	8	15	227	288	23	2	65	2,447	227	41	2,179	..	2,179	57	4	80	0.89	
Government Health ..	11	28	29	45	7	18	99	122	1	360	42	213	150	..	150	109	..	..	0.42	
S.H.B. ..	40	60	42	91	26	38	..	..	..	297	16	..	133	..	133	9	..	..	0.45	
Port Health ..	..	..	27	55	6	5	7	9	..	109	7	109	..	..	..	..	..	..	..	Fumigated HCN.
Total ..	810	1148	106	206	266	349	129	133	66	3,213	292	363	2,462	..	2,462	175	4	80	..	
Grand Total ..	1,958		312		615		262		66	3,213	292	363	2,462	..	2,462	175	84		..	
Pregnant Rats ..	..	223	..	20	..	12	..	37	..	..	292	..	..	..	..	..	..	..	..

All the Rats were dissected and none were found infected with Plague.
Twenty-two live rats were sent to the D.A.D.A.H.HQ. Singapore Base District.
Seventeen live rats were sent to the Dept. of Parasitology, University of Malaya, Singapore.
Three live rats infected with T. Lewisi were sent to the Department of Parasitology, University of Malaya, Singapore.
Seven live rats were sent to the Department of Zoology, University of Malaya, Singapore.
All these rats are not included in the above totals.

Chapter Thirty-seven

MEDICAL STORES AND PHARMACEUTICAL SERVICE

THIS DEPARTMENT is charged with the responsibility for the procurement, manufacture and supply of drugs, chemicals and medical stores to all Government hospitals and clinics. The services of this Department are also utilised by the Primary Production Department of the Ministry of National Development for whom many veterinary medicines are manufactured and sold at cost. The University of Singapore, S.A.T.A., statutory bodies, charitable institutions, schools and Government departments also utilise the services of this Department as a comprehensive range of items required by these institutions is held in stock by the Stores.

The Stores and Manufactory, comprising three large godowns and an administrative block housing the manufacturing laboratories are situated at Silat Road in 2 acres of ground adjacent to the General Hospital. Two other godowns, for the storage of bulky items are at McAlister Road. An extension to the Tablet Laboratory was completed in December 1961 at a cost of \$40,000.

The work of this Department falls into two categories — manufacture of pharmaceuticals and stores work. Approximately 50 per cent of the staff is engaged in manufacture and the rest is employed in the Stores section. The Government Laboratory is the only establishment of any size in Singapore undertaking manufacture of pharmaceutical preparations.

During the year the physical integration of the City Medical Store was completed. The stocks, equipment and staff of the City Medical Store was transferred to Government Pharmaceutical Laboratory and Store and the City Store at Mandalay Road was closed down. The duties and functions of the City Medical Store, which was responsible for the supply of drugs and stores to City medical clinics was taken over by the Government Pharmaceutical Laboratory and Store. This amalgamation eliminated duplication of work and functions and made it possible to co-ordinate the activities of staff from both stores, making it possible to meet the increased volume of work arising from the expansion of Medical Services during the year.

STAFF

At the end of the year the staff at Government Pharmaceutical Laboratory and Store totalled 124. The professional staff comprised the Superintending Pharmaceutical Chemist, Pharmaceutical Chemist, and four pharmacists. The administrative, accounting and clerical staff numbered fourteen and the technical staff, mostly dispensing assistants and storekeepers, numbered 19. The rest of the staff numbering 85 is Division IV staff consisting of storemen/packers, drivers, watchmen, etc.

MANUFACTURE

The volume of manufacture was maintained at a level sufficient to meet all requirements in spite of difficulties caused by the stoppage of work in the Tablet Laboratory during the last quarter of the year because of alterations and addition to the Laboratory.

The production figures for the year 1955 to 1961 are given in Table 120. The value of production at cost of materials processed, in 1961 amounted to about \$887,000 as compared to \$847,000 in 1960. About 2,700 work tickets for a wide variety of medicines were dealt with by the Manufacturing Laboratories. Except for the production of tablets the production of all other items

was maintained at the 1960 level. The manufacture of pharmaceuticals at Government Pharmaceutical Laboratory and Store enable the Government to cut down cost, since proprietary pharmaceuticals imported from distant countries are expensive. The manufacture is planned to keep pace with consumption, so that all stocks are consumed within a short time of manufacture. This practice eliminates one of the main causes of wastage arising from long storage under adverse climatic conditions of high humidity and temperature obtaining in Singapore. It is estimated that the saving effected by local production is sufficient to meet the total establishment cost of the Government Pharmaceutical Laboratory and Store. The accommodation and facilities in the laboratories are inadequate and funds totalling \$600,000 have been requested under Development Estimates for the purpose of erecting a laboratory block and ancillary facilities, which when constructed will be adequate to meet all foreseeable demands for laboratory and manufacturing accommodation.

TABLE 120

PRODUCTION IN GOVERNMENT PHARMACEUTICAL LABORATORY AND STORE 1955—1961

	1955	1956	1957	1958	1959	1960	1961
Tablets (millions) ..	39.4	45.6	56.4	54.9	90.7	105.8	89.4
Ampoules (no.)	324,400	563,700	440,000	535,600	593,569	608,352	615,680
Multidose Inj. Vials (no.)	73,900	29,400	19,200	17,000	20,690	28,810	28,520
Sterile Transfusion Fluids (pint bottles)	18,500	37,500	76,700	74,600	104,061	144,090	144,640
Eyedrop/Eardrop Vials (no.) ..	..	13,600	14,000	44,500	69,040	99,230	111,980
Tinctures, Infusions, Extracts (gals.) ..	1,625	2,250	2,318	3,300	4,800	5,500	7,990
Emulsions (gal.) ..	590	476	490	500	700	780	760
Mixtures, Lotions, Liniments (gal.) ..	14,700	8,900	8,190	8,950	11,700	15,200	18,800
Antiseptic Fluids (gal.)	..	4,740	7,290	8,300	8,600	9,500	10,170
Linctus and Syrups (gal.)	1,260	1,360	2,620	7,700	11,300	16,200	18,110
Ointments and Creams (lb.) ..	8,600	7,700	10,800	10,900	20,000	21,600	20,220
Ointments and Creams in tubes (no.) ..	9,500	20,100	52,300	71,450	80,900	69,800	76,260
Laboratory Reagent Solutions (litre) ..	880	436	520	640	490	1,100	430
Suppositories and Pessaries (no.) ..	19,900	18,900	33,900	33,100	63,830	88,600	39,130
Dressings (tin × 20's) ..	..	..	..	..	..	..	2,740
Granules (lb.) ..	..	..	..	..	..	..	5,740
Smelling Salt (1 oz. bottle) ..	..	..	..	..	..	..	670
Capsules ..	..	..	..	..	..	..	500

STORES SECTION

The procurement of stores, disposal, accounting and stock management is conducted in accordance with the provisions of *Instruction Manual No. 3*. The Crown Agents, as agents, for the Singapore Government, are responsible for the purchase, payment and forwarding of all items of stores purchased

from overseas territories. Many overseas inquiries from interested parties are received by the Department and in all cases they were requested to contact the Crown Agents. The connection with Crown Agents is a desirable feature since they have wide experience in the procurement of supplies and their worldwide connections and knowledge of the standing of supply firms enable them to purchase stores at very competitive rates. They have been prompt in meeting claims and deficiencies and are prepared to render technical assistance and advice whenever called upon to do so. Preference is, however, given to local firms provided the supply offered meets with standards and specifications called for. Many local agents are mere indenting agents and have inadequate knowledge of the products they offer, as a result of which some supplies were below standard. Rejection of such supplies has caused this Department some difficulty as stocks had to be obtained at short notice from other sources, often at higher prices, to meet orders for such items from consumer units.

The value of purchases during the year through Crown Agents amounted to a little over 1.7 million dollars, and local purchases amounted to 697,000 dollars as compared with 2.3 million and 808,000 dollars respectively in 1960. Purchases of drugs and chemicals accounted for two-thirds of the total cost and surgical equipment, dressings and hospital furniture accounted for the remainder. It is the practice of this Department to purchase for stock only items for which widespread demand exists, and special equipment and hospital furniture required for extension of services or new units are purchased as and when required by submitting special indents chargeable to the ordering units' vote.

The work involving receipts, accounting and deliveries of stores utilises a considerable number of staff. Collection of stores at Singapore Harbour Board involved the processing of 684 bills of lading for a total of 6,330 cases and drums of cargo, and 1,300 parcels through the Post Office. A smaller number was also collected from the Singapore Railway Station and Singapore Airport.

The accounting section was responsible for costing, and billing of stores ordered on 9,900 Medical Stores Requisitions by consumer units. All receipts and dispersal of stores are machine posted. A card indexing system provides information on stock, cost, and other relevant information. The total value of stores issued during the year amounted to 2.62 million dollars. At any one time the store holds stocks sufficient to meet all foreseeable demands for six months. At the end of the year the stock value amounted to a little over 1.6 million dollars. The value of stores written off at the conclusion of the annual survey amounted to \$2,925, which is less than 1 per cent of the turn over.

Supplies are made to consumer units at monthly intervals except in cases of urgency, which may require more frequent deliveries. About 150 units are served monthly. A fleet of six lorries and vans is utilised for this purpose.

THE PHARMACEUTICAL SERVICE

This service comprises all hospital and clinic pharmacies and are staffed by pharmacists, and dispensing assistants. The staff position at the end of the year is given in Table 121 below. There were five vacancies for pharmacists, and fourteen vacancies for dispensing assistants at the end of the year. The shortage of qualified and experienced staff caused considerable difficulties, but the co-operation of the staff and their willingness to work overtime helped to maintain the efficiency of the service.

TABLE 121
STAFF OF THE PHARMACEUTICAL SERVICE

		<i>Pharma- ceutical Chemist</i>	<i>Pharma- cists</i>	<i>Pupil Pharma- cists</i>	<i>Dispensing Assistants</i>
Ministry of Health Headquarters	...	—	1	—	—
Government Pharmaceutical Laboratory and Store	... ..	1	4	—	7
Kandang Kerbau Hospital	...	—	2	—	7
Tan Tock Seng Hospital	...	—	2	—	6
Trafalgar Home	... ..	—	1	—	1
Woodbridge Hospital	... ..	—	1	—	1
Middle Road Hospital	... ..	—	1	—	3
Outpatient Services	... ..	—	4	—	11
General Hospital	... ..	1	5	—	41
Thomson Road Hospital	... ..	—	1	—	1
		—	—	—	—
Total	...	2	22	—	78
		—	—	—	—

The pharmacist attached to the Ministry of Health was gazetted to perform the duties of Inspector of Poisons and Dangerous Drugs. Most premises and records of Poison Licence holders were inspected during the course of the year and were found to be in order. A number of prosecutions for offences under the Poisons Ordinance, and the Medical (Advertisement and Sale) Ordinance, was instituted by the O.C. Commercial Crimes on information provided by the Inspector. The illegal import of poisons into Singapore was made difficult by requiring importers to submit inward declarations of medicines for endorsement by the Ministry.

The Pharmaceutical Service spent about 1.7 million dollars on drugs and chemicals. The main items of expenditure are given in Table 122.

The expenditure on antibiotics amounted to about 407,000 representing 25 per cent of the total cost. Drugs for the treatment of tuberculosis amounted to about 300,000 or 18 per cent of the total cost. Considerable efforts were made to keep expenditure within reasonable limit. During the year the Drug Advisory Committees set up in the main hospitals reviewed the drugs in current use and recommended acceptable products and limited the introduction of new and expensive items to those of proved value.

It is a pleasure to record here the assistance rendered by the Chemistry Department and Pathology Department. The Chief Chemist and his assistants gave advice on new pharmaceutical formulations and analysed products put by our manufacturing laboratories for purity and compliance with standards given in the B.P., B.P.C. and U.S.P. Sterility tests and biological assays on sterile preparations and antibiotics were performed by the Senior Pathologist.

PART IV
CHEMISTRY DIVISION

Chapter Thirty-eight

CHEMISTRY DIVISION

GENERAL

WITH the impending integration of the City Analyst's Department with the Department of Chemistry, the estimates of the City Analyst's Department appeared in the 1961 Estimates of the Department of Chemistry. The Chief Chemist and Chief Inspector of Dangerous Materials was responsible for the day-to-day administration of the City Analyst's Department.

All the services provided by the City Analyst's laboratories are duplicated to a greater or less degree in the Department of Chemistry. The physical integration of the City Analyst's Department with the Department of Chemistry would result in unification of functions and ease of administrative control. Duplication of scientific journals and books for the library would cease, resulting in savings. The physical integration would necessitate the re-arrangement of two of the laboratories to provide more working bench space and the erection of an apparatus store to provide storage space for the increased apparatus.

During the latter half of the year re-construction work was undertaken in the two ground floor laboratories. The alterations involving only rebenching, provision of new benches and installation of electrical, gas and water fittings were completed in December.

The Chief Chemist served on the Research Advisory Committee of the Malayan Pineapple Industry Board.

STAFF

The staffing position at the end of the year is shown in Appendix I, Miss P. R. Williams, Chemist, resigned in March while on vacation leave in Ceylon. Mr. Lim Ho Hup, Singapore Document Examiner, returned from the United States in November but was seconded to the Economic Development Board. Mr. Ch'ng Beng Han, Assistant Inspector of Dangerous Materials, who has been trained in handwriting comparison, was Acting Document Examiner as from January 1961. An Assistant Inspector of Dangerous Materials, Mr. Yeow Chee Tiong, B.Sc., Nanyang University, was appointed in May on a month-to-month basis but resigned in July in order to proceed to the United States on a scholarship sponsored by the Singapore Government. The vacancy arising was not filled.

In May, a Laboratory Assistant, Mr. Yek Yew Choon, resigned and the vacancy arising was filled in November by the appointment of Mr. Chan Sing Hong.

Three chemists, two Assistant Inspectors of Dangerous Materials and the Chief Laboratory Assistant attended the Political Study Course arranged for senior officers.

Two Iranian Police officers, Major Seyed Taheri and Lieutenant Ahmad Taheri and groups of students from Victoria School, Gan Eng Seng School and Nanyang University visited the Department of Chemistry.

The Senior Chemist gave six lectures to Inspectors, two lectures to Cadet Inspectors, three lectures to Criminal Investigations Department trainees and two lectures to Junior Non-Commissioned Officers on forensic science as an aid to police investigations. These lectures were followed by discussions and those for Inspectors were refresher courses.

Court attendances by chemists have again decreased and the Department would like to take this opportunity to express its appreciation to the Police and Customs and Excise Department for their co-operation and effort in keeping these court attendances to a minimum. There were 52 court appearances this year as compared with 70 court appearances in 1960. Approximately 38 per cent of these court appearances were in connection with opium-smoking cases.

Approximately 598 photographs were made to clarify certain reports, the majority of which were connected with document examination.

The number of samples analysed and/or examined was 16,473 compared with 20,616 for 1960. There was a large decrease in samples from the Customs and Excise Department and a decrease from non-official sources.

The Collector of Federal Customs Duties ceased to send in samples of sodium arsenite and rubber latices. Such samples are now submitted directly by the commercial firms. The samples of sodium arsenite are checked for compliance with the statutory colour requirement of the Federation Poisons (Sodium Arsenite) Ordinance, 1949 and the samples of rubber latices are checked for dry rubber content in connection with assessment of duty.

As reported last year, Mr. Ch'ng Beng Han, Assistant Inspector of Dangerous Materials, reported for duty in December 1960 after completing his training in handwriting comparison. Last year in the absence of a handwriting expert, the type of documents examined had to be restricted to those for erasures both mechanical and chemical which did not involve comparison of handwriting. This year documents involving comparison of handwriting could be accepted for examination. The number of documents examined was 989 as compared with 171 for last year.

The distribution of work for the past ten years is shown on the charts on pages 224 and 225. A summary of the work of the various sections is shown in the table Appendix II and publication in scientific journals is shown in Appendix III on page 226.

This year fees for non-official work amounted to approximately \$129,180 as compared with approximately \$144,251 in 1960. This was due to less number of tankers and compartments in ships for inspection of freedom of inflammable petroleum vapour.

FORENSIC SECTION

The forensic section this year examined slightly less exhibits than in the previous year. Whereas total exhibits last year stood at 4,292, the present total was 3,726 in number.

Most of the decrease were exhibits in cases of chandu and opium, blood and semen, illicit liquors, drugs and tobacco. However, there were in fact actual increases in investigational exhibits in firearms and especially in documents.

Visits to scenes of crime, etc. were as usual carried out by the chemists on a number of occasions both during office hours and outside. Such visits especially in cases like arson could be of benefit in assisting the Police in their investigations.

A summary of the exhibits under the different headings follows:

Arson

Twenty-one cases of arson or suspected arson were investigated, indicating a slight increase over the previous year. These involved thirty-three exhibits covering a wide variety of objects.

Most of the cases involved attap houses where any attempts by the arsonists would be more or less assured of a chance of being successful.

Among these were some from Kampong Henderson where it appeared that the frequency of outbreak of fire suddenly increased following the huge fire in the neighbouring Kampong Tiong Bahru.

The methods used by the arsonists were generally similar — pieces of lighted rags weighed with stones, or in one case a pair of scissors, with sometimes an additional rod or stick as handle, were thrown on to the attap roof. Some of these even had crude time delay devices in the form of joss-sticks, cigarettes, match sticks and a sparkler firework. In a number of these cases, especially where the exhibits had not been too far burnt and where they could be brought to this Department sufficiently soon after the incident, volatile inflammable oil such as kerosene or petrol was detected.

Among the more unusual cases was one where an “explosion” was reported in a kampong. The exhibit in this case was examined and found to be the remains and residues of a type of handflare such as that used for marine distress signals.

There was another case where an electric frying cooker was badly gutted by fire. The fat was examined for any unusual inflammable material but none was detected. The cause of the fire was hence presumed to be one of those rare occurrences which may happen to fat being heated, that is, a sudden cracking of the fat into volatile components which immediately burst into flame.

Blood and Semen Stains

The number of the exhibits showed some decrease from the previous year.

Of the total exhibits shown in the table, almost 630 were for examination of blood and of these about 150 gave negative results. The majority of the remainder gave a positive precipitin reaction for human blood and of these positive ones more than one half were grouped as well. Determination of blood group on dried stains, as opposed to that on fresh blood, was extremely tedious and time consuming. Such determination was therefore only carried out when the information whereby obtained would serve as additional valuable confirmatory evidence.

Among the exhibits submitted for blood examination, usually knives, clothing etc., were some motor cars and, from one case of rioting inside a prison, was a heavy club made in the form of a home-made musical instrument like a banjo.

There was a particularly gruesome case where three persons in a lonely rural road at night were knocked down by a motor car apparently deliberately. The investigation following this case involved the examination of up to seven motor cars for blood stains in an attempt to pin-point the suspect vehicle. Unfortunately no conclusive result was obtained by these examinations.

The examination of exhibits for seminal stains followed more or less the pattern of previous years. About 26 per cent of these exhibits were proved to be stained.

Chandu and Opium

Chandu and opium, both exhibits and cases showed a decrease in number from the previous year. This was mainly due to the drop in the Police exhibits which resulted from raids carried out on opium dens and consisted mainly of opium smoking pipes, needles and packets of chandu.

The exhibits submitted by the Customs Department which generally consisted of larger quantities of raw opium per exhibit, continued to be about the same number as the previous year.

Approximately 1 per cent of the total number of exhibits were found to be not chandu or opium as originally suspected.

The "non-official" samples in the table below were mostly exhibits from the North Borneo and Sarawak Police.

Documents

All the work was carried out by Mr. Ch'ng Beng Han, Acting Document Examiner, Singapore.

This year, the Document Examination Section resumed its full activities, undertaking cases involving handwriting and signatures comparisons to establish authorship, in addition to the examination of fraudulent erasures, alterations and additions in tampered documents. In all, 151 cases comprising a total of 989 documents were examined. The Singapore Police submitted the bulk of the exhibits (135 cases comprising 914 documents) while the rest of the documents came from the Department of Immigration and Postal Services, Central Provident Fund Board, the Ministry of Health, the Pine-apple Board, the Sarawak Constabulary and the Naval Police.

About two-thirds of the cases received involved the examination and identification of handwriting and signatures. A good proportion, about 40 per cent, of these handwriting cases were Chinese documents. English writing and in a few instances Romanised Malay writing made up the rest of the documents. The documents ranged from cheques, receipts, extortion and threat letters to suicide notes, and anonymous writing on pieces of paper, cardboard and exercise books.

An interesting case concerned the report to the Police of loss of textile goods by a textile firm. The Police later recovered a lot of suspected stolen goods in which was found a bale of cloth, the cardboard core-piece of which had some writing randomly written on it. The proprietor of the firm claimed the handwriting to be his and the claim was confirmed by handwriting comparisons. The finding thus provided an additional evidence to link the recovered goods with the owner of the lost goods.

While positive identification was in many cases made by handwriting examination, there were also cases in which negative conclusions on authorship were arrived at. In a case of an anonymous letter of a scurrilous nature a junior staff in a department was strongly suspected due to certain apparent similarities in the handwriting. Careful analysis of the questioned handwriting and the specimen handwriting, however, showed many significant differences, both obvious and unobvious, which pointed to different authorship.

The only case that came from the Naval Police was in connection with the theft and subsequent cashing of a British Post Office Savings Bank withdrawal form. There were three suspects and handwriting comparisons led to the identification of one of them as the writer who wrote the particulars on the withdrawal form. The handwriting report was instrumental in securing a conviction under the Naval Discipline Act.

Ultra-violet and infra-red lights, as usual, proved very useful in the examination of tampered documents. There was a case in which a typed figure was added to the original quotation in a "tender" form. Apart from the mal-alignment in the typescripts, infra-red photography strikingly demonstrated that the carbon impression of the added figure on the duplicate copy was made with a carbon paper different from that used in typing the original entries.

Other than handwriting examination, there were also a number of cases involving the comparison of typescripts, and in one of these, a commercial fraud case, a typewriter was positively identified as the machine used to prepare documents connected with the fraud.

Drugs

This section covers all the samples which were analysed for presence of listed poisons or dangerous drugs, apart from chandu or raw opium, and which were submitted for checking or were actual exhibits in intended prosecution cases.

The samples included a wide variety of materials among which were quite a number where penicillin and sulpha drugs were found. There were two cases where tonics for poultry were found to contain strychnine.

Morphine, codeine and, in one case, ethyl morphine were detected in a number of medicines especially cough mixtures. Morphine in more or less pure form and obviously meant for administering to addicts, were also submitted.

There was also a case submitted by the Customs of 15 bottles of cocaine hydrochloride which was usually quite rare in this part of the world.

There were two Customs' cases involving heroin which is also rarely met with in Malaya. The heroin in one case was found to contain barbitone as well.

As usual every year a number of Indian hemp was also examined.

Firearms Cases

Firearms cases showed an increase over the previous year. As usual most of the cases involved the examination of the Police Force's own revolvers for evidence of recent firing and their bullets and cartridge cases to obtain confirmation on the identity of the weapons which discharged them.

There were also other examinations which were more investigational in nature, e.g. those which require the determination of firing ranges on clothing etc., especially in cases of suicides.

There was one investigation involving a kidnapping attempt which fortunately was not successful but during which the intended victim was shot. About three months later the police recovered an automatic pistol which was examined and confirmed to be the very weapon used in the earlier kidnapping attempt.

Another notable case was of a man who was murdered inside his motor car. In addition to the usual exhibits, the motor car, with its shot tyre and window pane, was also examined.

There was one case of thirteen shot-gun cartridge cases submitted by the Sarawak Police with the request for the determination if one of them could have been fired by a gun which fired any of the other twelve.

Gold

Five cases involving gold were received. This included in all 162 bars of which a total of 11 were analysed and found to be 99.8 per cent or, in a few cases, 97.5 per cent gold.

The exhibits also included gold coins and bangles. The former were mainly United States \$20 and \$10 coins with two Mexican 50 peso pieces.

Liquors

Liquors suspected to be adulterated were submitted by both the Customs and the Police. Not all the exhibits were found to be adulterated however. Only about half of the total of 54 exhibits suspected could be proved with certainty as being not genuine as represented by their labels. Most of these exhibits were beers and stout while there were two of whisky.

There was an unusual case of adulterated Chinese samsoo. This was not normally met with possibly because this class of liquor was usually considered not worth-while adulterating.

In another case, some liquors from a bar of a certain club-house were submitted. When analysed, no ethyl alcohol whatsoever was detected in the samples. It appeared that this case became suspect and was investigated into only when the bar-boy died suddenly and the club secretary started looking into their stock!

Illicit liquors received were less in number than last year's. As usual these were from the Customs and consisted mainly of illicitly fermented mash or distilled spirit.

There was one case of brandy and whisky which was seized as uncustomed goods.

Tobacco

Seizures of tobacco smuggled into the State appear to be decreasing each year and hence the comparatively small number of tobacco cases received by this Department in 1961.

As usual most of the exhibits were packets and cartons of different brands of cigarettes which had to be weighed and examined by the Chemist and proved for the benefit of the courts as being tobacco.

One case had an unusually large number of exhibits which required special and laborious examination. This was an attempt at smuggling large quantities of cut tobacco into the State by taking advantage of this island's position as an entrepot centre. The consignment of tobacco in question after being imported on transit and hence uncustomed, was ostensibly re-exported again. It was later discovered however, that the re-exported consignment, unlike the original imports, consisted mainly of worthless non-tobacco material—the greater part of the tobacco having in the meantime been smuggled out of bond. Fifty-seven exhibits, representing 10 per cent of the total number of exhibits involved, were examined in this case to prove that they were different from the tobacco originally imported.

Vehicles

Vehicles were submitted mainly for examination of the stamped numbers which had been filed off. These were specially prevalent in cases of stolen bicycles and motor-cycles. The erased numbers were developed and could be deciphered in about one-third of the cases.

Motor cars were also received for a variety of reasons; for investigation into hit-and-run cases, for corrosive substances or paint removers which had been thrown on the vehicles and in certain attempted kidnapping, to obtain proof that a particular motor car which was recovered later, was involved by comparison of the broken glass found at the scene and on the vehicle itself.

There was a certain case where very late at night, two lorries and a motor van parked by the road side and a number of other things like rubber mattress in a shop, a charpoy, a stall etc., were all set on fire at very close intervals to one another. This series of fires within a small area was presumably the work of one person. Unfortunately no one was apprehended although the incident did not occur again.

Examination of the exhibits showed that the fire either had been started with lubricating oil which most of the lorries carried in tins in the driving compartments or were on exhibits which were by themselves inflammable.

Miscellaneous

In addition to the exhibits under the earlier mentioned headings, most of which sufficed with more or less routine examinations, forensic work would invariably include those which were unusual and unique and requiring special treatment and methodology in their examination. These latter were usually classified under miscellaneous and the cases involved covered a wide range of offences from throwing of faecal matter into postal boxes to possession of explosives.

A rather large proportion of these were acids or other corrosive substances in throwing cases. Sulphuric acid which was particularly destructive, predominated probably because of its widespread availability. However, hydrochloric acid, nitric acid, formic acid, phenol and caustic soda were also met with.

Cases of throwing of pepper powder were also submitted. These were usually in connection with day light robberies and were meant to temporarily incapacitate the victims.

In an attempted robbery case, that of cutting out a bank safe, the police submitted two gas cylinders found at the scene and a motor car with a view of connecting them together. Bitumenous substances found in the car and found adhering to the cylinders were analysed and proved to be similar thus showing that this car was used in committing the crime.

There was an exhibit consisting of a pile of charred paper which was claimed to be burnt currency notes. This was examined and the claim disproved.

A very unusual exhibit was submitted by the Police in the form of a "charm" which was claimed by the user to be capable of bringing deaths to a neighbouring family on whom it was used. Although nothing specifically could be done by this Department to refute such claims, the charm was found to consist essentially of parts of certain flowers, parts of leaves, possibly betel, red dye and an oil possibly sesame.

Cases of fraud were also investigated. The more interesting ones included a well-known brand of baking flour for which no chemical differences from the genuine one could be detected, a large number of various brands of hair creams and brilliantines, most of which were proved to be imitations, boxes of powder claimed to be "the most effective disinfecting insecticide" and found to contain nothing more than sodium carbonate and a large number of sunglasses, imitative even to the trade mark, of a well-known brand.

In the last case of sunglasses, in addition to examination of other features of the exhibits, the absorption spectra of the glasses themselves were profitably and conveniently utilised to prove their non-genuineness for even though visually they might appear similar in colour to the genuine article, the spectra outside the visible orange, and especially towards the infra-red, were different. The imitation ones were relatively transparent in this region which the genuine one, as a good quality expensive sunglass should, was strongly absorbing.

The explosives analysed under this section were exhibits which were discovered by Customs officers while on raids for illicit liquors. Their alertness was commendable for these substances were proved to be mixtures of ammonium nitrate and T.N.T. when analysed. Presumably these were meant to be used in the extremely wasteful, apart from being illegal, method of fishing with explosives.

DISTRIBUTION OF WORK, 1961

Class of Work	SOURCE						
	Customs	Medical	Police	Other Departments	Non-Official	Total Samples	Total Cases
Arson .. ..	..	..	33	..	3	36	21
Blood and Semen .. ..	..	1	679	..	39	719	191
Chandu and Opium	210	..	674	..	18	902	270
Documents .. ..	..	3	914	30	42	989	151
Drugs	62	20	123	1	8	214	73
Firearms Cases .. ..	..	1	103	..	13	117	20
Gold	11	..	..	..	..	11	5
<i>Liquors:</i>							
Adulterated	13	..	62	..	..	75	8
Illicit	195	..	..	..	..	195	27
Tobacco	82	..	..	..	..	82	9
Vehicles .. ..	..	..	41	..	..	41	21
Miscellaneous	2	..	335	..	8	345	89
Total	575	25	2,964	31	131	3,726	885

HEALTH SECTION

Food and Drugs Ordinance

The City Food and Drugs Inspectors submitted 21 formal samples comprising cod liver oil, vitamin A capsules and multi-vitamin tablets for assay of vitamin A content. Eleven samples were found to be deficient in vitamin A to the extent varying from 21.4 per cent to 69 per cent of the stated amounts.

Other Foods

The samples under this heading included informal and commercial samples. The Food and Drugs Inspectors submitted 26 informal samples comprising essentially cod liver oil, vitamin A capsules and multi-vitamin tablets for assay of vitamin A contents. Formal samples were subsequently submitted in respect of those samples whose vitamin A contents were found to be far below that claimed on the labels.

Samples from commercial sources and Government Departments other than Medical Department included condensed milk, vitaminised skimmed milk, glucose and sweet. The sample of glucose submitted by the Commercial Crime Branch of the Police Department was found to contain 22 per cent of glucose monohydrate and 78 per cent sucrose. The label on the tin claimed to contain 98.9 per cent glucose monohydrate.

Other Medicines and Drugs

The number of samples from the Government Pharmaceutical Laboratory and Store (formerly known as Government Medical Store) has increased, 944 as compared with 772 for 1960. The majority of these samples

was from batches of preparations. As usual these samples were assayed and/or examined for compliance with British Pharmacopoeia Standards thus ensuring that the drugs and medicines to be issued to government hospitals were of the correct nature and strength.

For the Customs and Excise Department 126 samples of raw opium, as compared with 89 for 1960, were assayed for their moisture and morphine contents.

The commercial samples comprised three samples of anæsthetic gases from the Royal Air Force for compliance with British Pharmacopoeia Standards and samples of medicinal pills for determining the presence or otherwise of common heavy metals and alkaloids.

Metallic Contamination

From the routine samples of liquor submitted by the Customs and Excise Department for spirit strength determination, 262 samples were checked for lead and copper contents. The samples which were checked included new brands of liquor and those brands which had previous record of high lead or copper content.

Two samples of liquor were found to contain copper in excess of the statutory limit and were recommended for prohibition of import.

Sewage

The number of samples analysed was 376 as compared with 480 in 1960. These samples from septic tanks and activated sludge plants were submitted by the Sewerage Department of the Public Works Department. A number of septic tanks were found to be not working satisfactorily and the quality of the effluents was poor.

Water

Chemical and bacteriological tests made on well waters from rural areas indicated that the water was unfit for human consumption. Two samples of water from bore holes were also found to be unfit for human consumption.

Commercial samples from storage tanks in two of the neighbouring islands were found to be satisfactory.

DISTRIBUTION OF WORK 1961

Class of Work	SOURCE						Total Cases
	Customs	Medical	Police	Other Departments	Non-Official	Total Samples	
Food and Drugs Ordinance .. ..	..	21	..	..	..	21	21
<i>Foods:</i>							
Other .. ..	..	31	13	1	17	62	2
<i>Medicine and Drugs:</i>							
Other	126	944	..	..	18	1,088	..
Metallic Contamination	262	..	..	..	..	262	..
Sewage .. ..	..	..	..	376	..	376	..
Water .. ..	..	49	..	8	44	101	..
Total ..	388	1,045	13	385	79	1,910	23

MISCELLANEOUS SECTION

General

Four hydrometers were checked as to their accuracy for the Customs and Excise Department.

A few samples of animal feeding stuff from the Primary Production Division were assayed for contents of moisture, protein, fat, fibre, ash, calcium, phosphorus and nitrogen free extract.

Before placing contracts the Police Department submitted three samples of cloth for a check of their colour fastness and shrinkage due to washing.

Metals, Minerals and Chemicals

Forty-seven samples of sodium arsenite were submitted by various commercial firms for compliance with the statutory colour requirement of the Federation Poisons (Sodium Arsenite) Ordinance, 1949. Nine samples were found to have a blue colouring matter whose intensities were below that prescribed. Out of these nine samples, five samples were found to have a colouring matter whose intensities were approximately 50 per cent of that prescribed.

It was predicted in last year's report that samples of synthetic detergents submitted by the Customs and Excise Department were expected to increase because of the Customs (Protective Duties) Order, 1960 which levies duties on soap but not on synthetic detergents. The number of such samples submitted for analysis as to the presence or absence of soap was 65 as compared with nine for 1960.

The Central Supplies Office submitted 30 samples of soap for analysis and compliance with specifications. Three samples of toilet soap were found to fail specifications in respect of content of total fatty matter and two samples in respect of chloride content. Five samples of washing soap, two samples of carbolic soap and two samples of soft soap were found not to comply with specifications in respect of one or more constituents.

The Primary Production Division submitted five samples of fertiliser for assay of contents of moisture, ammoniacal nitrogen, organic nitrogen, nitrate nitrogen, phosphorus and potassium and one sample for assay of water soluble extract and chloride content.

Book preservatives were prepared for the Ministry of Culture, Department of Statistics, Malayan Meteorological Service and First Civil District Judge. Phenolised starch paste and solution for testing residual hypo on films were prepared for the Commissioner for Registration and Chief Surveyor respectively.

The moisture contents and specific gravity of 16 samples of sub-soil taken from various places in the State of Singapore were determined for the Chief Surveyor. The results were required by the Japanese Antarctic Research Expedition team in connection with their gravimetric observation.

Microfilm

Out of 516 samples of microfilm tested for residual hypo content for the Chief Surveyor, one sample was found to contain a residual hypo content of 0.002 milligram per square inch.

Oils

The samples consisted of anti-malarial oil from the Health Department, and hydrocarbon solvents from the Customs and Excise Department for classification and in connection with revenue collection. Out of 23 hydrocarbon solvents, three samples were for flash point determinations, three samples for volume and the others for classification. Nine samples were recommended as not petroleum as defined in the Customs Ordinance, 1960.

DISTRIBUTION OF WORK 1961

Class of Work	SOURCE						
	Customs	Medical	Police	Other Depart- ments	Non- Official	Total Samples	Total Cases
General ..	4	3	3	13	17	40	..
Metals, Minerals and Chemicals ..	65	5	..	64	51	185	..
Microfilm ..	..	..	..	516	..	516	..
Oil	23	7	..	..	..	30	..
Total ..	92	15	3	593	68	771	..

REVENUE SECTION

This section is concerned with the revenue work for the Customs and Excise Department. The preventive and other aspects of Customs work are included in the appropriate sections of this report.

As usual the accurate determinations of spirit strength and/or volume of liquors comprised the main portion of the work done under this section. This work is done for the Customs and Excise Department to assist them in the assessment of duty on liquors which is based on spirit strength and volume. The total number of liquor samples analysed was 4,677. The high degree of accuracy of the analytical determinations was shown in the results on the regular check samples submitted by the Customs Department.

European-type Liquors

The number of samples showed a decrease over that for last year.

Apart from the determination of their spirit strengths and volume, they were checked for metallic contents and for conformity to the Food and Drugs Regulations which specify spirit strength minima for brandy, whisky, rum, gin, port and sherry, and an ester minimum for brandy.

Six samples of brandy on account of their low spirit strength and one sample on account of its low ester content were refused classification as such and could only be classified as "Other Liquor" for duty purposes.

In several cases where samples were found to just conform to the maximum copper content and minimum spirit strength permitted under the Food and Drugs Regulations letters were written to the importers to inform them of the fact so that they might suggest to their suppliers the desirability of reducing the copper content or of maintaining a comfortable margin above the permitted limit for spirit strength set out in the Food and Drugs Regulations.

Samsoo

The number of Chinese liquors submitted for analysis has decreased slightly, 3,653 as compared with 3,941 for 1960. With only one exception, the lead and copper contents in imported and local samsos were within the maximum limits permitted under the Food and Drugs Regulations, 1957. The lead content in one imported samsoo was found to be excessive and prohibition of import was therefore recommended. Labels which did not comply with the labelling requirements were still being encountered. In such cases the importers were advised of the fact by letter.

Methylated Spirit

The number of methylated spirit samples checked for adequate methylation has decreased considerably, 769 as compared with 2,196 for 1960. This was because most samples submitted for analysis have been found to be satisfactorily methylated. Normally ten per cent of the total number of drums from a consignment was checked and if any insufficient methylation was detected another ten per cent of the drum has to be checked and if necessary all the drums from the consignment would be checked. In only one case, one drum from a consignment was found deficient in pyridine and was subsequently treated with pyridine.

Denaturation

The total number of drums of alcohol denatured has increased, 375 compared with 318 for last year. Duty free alcohol for use in industry has to be treated with denaturants. The usual denaturants used throughout the year are five per cent essential oil or one per cent dimethylphthalate for use in perfumery, or one pound tobacco dust to every 6.3 imperial gallons of alcohol for use in tobacco industry, or five per cent methyl alcohol and one per cent kerosene for use in cooling system in breweries.

Toddy

There has been a decrease in the number of toddy samples. The standard of these samples was the same as that of last year. Only about half the samples examined were classified as good, that is pure fresh toddy.

Rubber Latex

Sixteen latex samples were submitted by commercial firms for the determinations of dry rubber content and specific gravity in connection with assessment of duty.

DISTRIBUTION OF WORK 1961

Class of Work	SOURCE						
	Customs	Medical	Police	Other Depart- ments	Non- Official	Total Samples	Total Cases
Denaturation of Spirit	..	..	..	..	375	375	..
<i>Liquors:</i>							
European type ..	983	..	..	..	2	985	..
Samsoo ..	3,653	..	..	..	..	3,653	..
Toddy ..	41	..	..	..	..	41	..
Methylated Spirit, etc.	769	..	..	..	145	914	..
Rubber Latex ..	..	..	..	..	16	16	..
Total ..	5,446	..	..	..	538	5,984	..

TOXICOLOGY SECTION

Blood and Urine for Alcohol

There were 284 blood and urine specimens for alcohol estimations this year. The majority of these specimens were from living persons suspected of being drunk. There were also 47 specimens such as stomach washouts, stomachs and livers analysed for alcohol content.

Specimens from deceased persons in cases such as suicide by hanging, death by stabbing, pedestrian knocked down by vehicle, driver driving car into the lamp-post and died, person falling down from a tree etc., were analysed to exclude or confirm alcoholic intoxication.

Poisoning Cases

In spite of the control of sale of sodium hydroxide, the number of cases of sodium hydroxide poisoning is still the highest this year as compared with cases involving other forms of poisoning.

A considerable number of stomach washouts were submitted in cases of suspected food poisoning to exclude chemical poisons. In one case, some forty student nurses from the General Hospital developed stomach aches and vomitted after a meal. Analysis of their stomach washouts revealed traces of anionic detergent in some of the specimens. It was possible that the detergent might have been mistaken for gourmet powder.

Another food poisoning case concerned a family of seven, two of whom subsequently died. The powder mixture found in the home of the victims, which had been used for flavouring the food appeared to contain star anise. However, there were no established methods to differentiate between the non-poisonous Chinese star anise and the poisonous Japanese star anise in mixtures containing clove, pepper, ginger and cinnamon bark. A method was developed in this department to differentiate the two species in such mixtures. Using this method, the department was able to establish that the powder mixture found in the home of the victims contained the poisonous Japanese star anise.

Poisoning by insecticides such as D.D.T., gammexane, malathion and parathion were encountered. Death within a short time occurred to a girl who had taken some liquid from a small bottle. She vomitted and died while on the way to the hospital. Analysis of the stomach washout revealed 1.28 grams of parathion.

Published minimum lethal dose of parathion is 0.02 gram. The importation of parathion is not permitted in the State of Singapore.

Brominated ureides such as carbromal and bromural sold under proprietary brands as "Relaxa Tabs" etc. formed another class of poisons frequently encountered. Of the 23 cases, only one was fatal, while the others recovered after the patients have been in a coma for varying lengths of time. Because of the frequency of such cases, legislation was passed in September 1961 to bring the sale of such poisons under control.

There were 41 cases of poisoning due to barbiturates this year. Other hypnotics encountered included chloral hydrate, dichloral-phenazone (dormwell) and phenaglycodol.

Eleven cases of stomach washouts were submitted for suspected doriden poisoning. Previous methods for the isolation and identification were found to be satisfactory for blood and urine specimens, but were unsatisfactory for stomach washouts due to the interference by the presence of fat. An existing method was modified and this new method was successfully applied for the estimation of doriden in specimens of stomach washouts.

There were 12 cases of methyl salicylate poisoning. Deaths occurred in three of these cases. In one case, a little girl of two accidentally took methyl salicylate and died two days later. The stomach washout was found to contain 252 milligrams of methyl salicylate. Specimens of blood and urine were also submitted for analysis to determine the salicylate level. The specimens of blood and urine were found to contain 49.5 milligrams and 102 milligrams calculated as methyl salicylate respectively.

Poisoning by noxious gases were from carbon monoxide and hydrogen cyanide. In the case of carbon monoxide poisoning, two specimens of blood were submitted and found to contain 9 per cent and 16 per cent of carboxy-haemoglobin. The victims recovered. However, in the case of hydrogen cyanide poisoning, the victims were less fortunate. The two persons involved in this case were engaged in fumigating a ship with hydrogen cyanide gas. One of them slipped and fell into the hold. The other in attempting to rescue his colleague, was also overcome by this gas. Both of them died very soon afterwards. Besides hydrogen cyanide, ethyl alcohol was also found in the specimens of blood from both the deceased. The presence of ethyl alcohol in the blood showed that both the deceased had consumed alcohol prior to their death, and the consumption of alcohol might have contributed to these fatal accidents.

From the Borneo territories, exhibits in connection with arsenical poisonings were received.

Specimens from a buffalo calf, suspected to have died from acute D.D.T. or arsenical poisoning, were submitted by the Veterinary Office in Jesselton. Analysis of the stomach contents and liver revealed 0.12 milligram and 0.20 milligram of arsenic respectively. No. D.D.T. was detected in the specimens. Subsequently, four more cows from the same herd were reported to have died. Arsenic was again found in the specimens which were sent here for analysis. Attempts were made by the Jesselton authorities to trace the source of this poisoning. As a result of this, six samples of water from the various water holes were submitted for analysis. One of these samples was found to contain 30 milligrams of arsenic per 100 millilitres of water. This finding was immediately telegraphed to Jesselton, and this prevented the further loss of cattle.

A specimen of meat was sent in for analysis, as a result of a suspected arsenical poisoning case. The Murut tribe in North Borneo have a special method of preparing a meat delicacy by putting some meat into a hollow bamboo, sealing up both ends of the bamboo, and then burying the bamboo in the earth for about a month. It was then taken out and the contents were said to be "good eating". Two persons eating this meat were found to be very ill with vomiting. On analysis, this meat was found to contain 29.6 milligrams of arsenic in 32 grams of the meat. It was possible that the meat might have been contaminated by the arsenic during the period when it was buried in the ground.

Another arsenical poisoning case also occurred in North Borneo. This time the deceased had a meal of rice, salted fish and tapioca leaves. Shortly afterwards, he developed severe abdominal pains and began to vomit. This continued throughout the night at intervals. He died the following day. Analysis of the stomach contents revealed 50 milligrams of arsenic. Further investigation in trying to trace the source of arsenic resulted in the Police submitting a sample of water taken from a small stream in a certain section where the deceased was employed before he died. Analysis showed that this water contained 700 parts per million of arsenic. To prevent more people

from using this water which was grossly polluted by arsenic, a telegram was sent immediately notifying the result to the Police Authority in North Borneo.

A specimen of lung from a deceased person, who had been working in a granite quarry for over thirty years, was submitted for free silica determination. Analysis showed that the specimen contained 1,800 parts per million of free silica.

An unusual case involved a patient in a hospital. He had some differences with the attendant in the ward. He found that the water which he poured out from his flask, filled by the attendant, was yellowish in colour and had an odour resembling that of urine. On analysis, this water was found to contain the constituents of urine, that is, indican, creatinine and urea, thus confirming that the water was contaminated with urine.

The urine of a seaman was submitted for analysis. He was suspected of having taken cantharides. The extract from the urine when applied on the surface of the arm produced blister, thus giving a positive reaction for cantharides.

An unusual poison was isolated from the stomach of a deceased suspected of arsenical poisoning. 50 milligrams of Physostigmine was isolated from the stomach. No arsenic, however, was detected in the stomach.

Of the 219 cases in which no poisons were detected, a large proportion were food poisoning cases due more likely to bacteria rather than chemical poisons. In addition, several autopsy cases were submitted purely to exclude poisoning.

Clinical Specimens

Specimens from suspected lead poisoning cases have increased. The total number of urine specimens for lead estimations submitted this year was 190 as compared with 79 for 1959 and 57 for 1960. This tremendous increase was due to investigations by hospitals on the rate of excretions of lead by patients after given a course of versenate. Thus in one single case of lead poisoning, the number of specimens submitted could be as many as six or sometimes even more. The results of analysis were given in terms of the total amount of lead excreted in a 24 hour specimen of urine. Anything above 0.1 milligram of lead per diem output of urine was regarded as a suspected lead poisoning case.

In all cases where the amount of lead was found to be high, a routine urinary coproporphyrin test was also carried out. All samples which were found to have high lead contents gave a pink or red fluorescence under ultra-violet light while samples which contained little or no lead gave a blue to bluish green fluorescence.

As in cases of suspected lead poisoning, the number of specimens for arsenic have also increased. 49 specimens were analysed as compared with 11 for 1959 and 11 for 1960. Specimens submitted included urine, hairs, nails and scrapings from skins. Out of the 49 specimens analysed, arsenic was detected in 40 specimens.

The total number of urine samples from the Opium Treatment Centre has decreased considerably, 208 for this year as compared with 539 for 1959 and 870 for 1960. Of this number, about half were positive for one or more of the opium alkaloids.

Other samples included two samples of blood for sulpha drugs, one sample of urine for mercury and two samples consisting of blood and stool for manganese.

SUBSTANCES FOUND AND NUMBER OF CASES

A.P.C.	...	...	7	Indican, creatinine and urea	...	1
Acid sulphate	...	...	1	Japanese star anise	...	1
Adrenaline	...	...	1	Kerosene	...	9
Ammonia	...	...	1	Largactil	...	6
Amytal	...	...	4	Lead	...	1
Antipyrine	...	...	2	Lignocaine	...	1
Aromatic amines	...	...	3	Magnesium silicate	...	1
Arsenic	...	...	11	Malathion	...	6
Aspirin	...	...	7	Mepacrine	...	1
Barbitone	...	...	1	Methyl salicylate	...	12
Barbiturates	...	...	28	Morphine	...	4
Bismuth	...	...	6	Morphine and codeine	...	23
Bismuth carbonate	...	...	1	Olive oil	...	1
Brasso	...	...	1	Opium	...	4
Brominated ureides	...	...	23	Organo nitro compound	...	1
Calcium	...	...	3	Parathion	...	1
Calcium magnesium phosphate	...	...	1	Pethidine	...	1
Camphor	...	...	3	Petrol	...	1
Cantharidin	...	...	1	Phenacetin	...	2
Carbon monoxide	...	...	2	Phenaglycodol	...	1
Chloral hydrate	...	...	1	Phenergan	...	3
Chlorine	...	...	1	Phenobaritone	...	3
Chloroquin	...	...	1	Phenolic derivatives	...	6
Cineole	...	...	1	Phenolphthalein	...	1
Cineole and turpentine	...	...	1	Phenothiazine compounds	...	1
Codeine	...	...	4	Physostigmine	...	1
Copper	...	...	1	Potassium permanganate	...	1
D.D.T.	...	...	7	Presidone	...	1
D.D.T. and Gammexane	...	...	3	Quinine	...	2
Dapsone	...	...	1	Reserpine	...	2
Detergent	...	...	17	Salicylic acid	...	8
Dettol	...	...	8	Silica	...	1
Doriden	...	...	11	Soap	...	4
Dormwell	...	...	3	Sodium carbonate	...	7
Ephedrine	...	...	3	Sodium hydroxide	...	39
Essential oil	...	...	1	Sodium hypochlorite	...	3
Ethyl alcohol	...	...	10	Sonalgin	...	1
Ethyl alcohol and methyl alcohol	...	...	1	Soneryl	...	4
Eucalyptus oil	...	...	1	Streptomycin	...	1
Fatty acids	...	...	3	Sulpha drug	...	1
Ferrous sulphate	...	...	1	Sulpha pyridine	...	1
Formalin	...	...	2	Sulpha thiazole	...	3
Formic acid	...	...	5	Sulphuric acid	...	1
Gammexane	...	...	2	Sulphite and sulphate	...	1
Gentian violet	...	...	1	Tuba root	...	1
Glass and cotton	...	...	1	Turpentine	...	2
Halogenated organic compounds	...	...	1	Valamin	...	2
Hydrochloric acid	...	...	3	Vegetable oil	...	2
Hydrogen cyanide	...	...	2	No poison found	...	219

DISTRIBUTION OF WORK 1961

Class of Work	SOURCE						
	Customs	Medical	Police	Other Depart- ments	Non- Official	Total Samples	Total Cases
Blood and urine for alcohol	329	..	..	2	331	165
<i>Poisoning cases:</i>							
Exhibits	129	111	..	24	264	} 604
Specimens	777	..	1	23	801	
Clinical specimens	452	..	..	..	452	..
Total	1,687	111	1	49	1,848	769

DANGEROUS AND HAZARDOUS MATERIALS SECTION

Eighteen requests (as compared with 115 for 1960) were made by the Singapore Harbour Board for classifying dangerous goods in transit through or to be landed at the State of Singapore.

Explosives

Twelve inspections of blasting explosives and detonators involving 18 consignments to be landed in the State of Singapore were carried out on board the ships. No inspection was carried out for 36 consignments of transit explosives. Fifty three samples of commercial blasting explosives were taken on board the ships for stability and exudation tests prescribed under the Arms and Explosives Ordinance. Two hundred and thirty-three certificates permitting the landing of explosives (including fireworks) or the off-loading into lighters in the case of transit cargoes were issued.

The Arms and Explosives Ordinance prohibits the importation, manufacture or possession of any firework composition or manufactured firework containing a chlorate or phosphorus or picric acid or any picrate or of any manufactured firework containing more than one-fifth of an ounce of explosive composition except with the prior permission of the Commissioner of Police. The above prohibition does not apply to amorces (caps or igniting tapes or toy pistols), or signals for use by ships or aircraft, or to Christmas crackers or bon-bon crackers or the snaps therefor or where used solely as a friction primer composition.

It also prohibits the importation, manufacture or possession of sand crackers or any squib or cracker which contains an explosive ingredient or mixture other than black gunpowder and any squib or cracker containing more than one-fifth of an ounce by weight of such black gunpowder.

Out of 86 samples of fireworks submitted by the Arms and Explosives Branch, Police Department, three samples of fireworks were found to contain chlorate, two contain phosphorus, and five samples to have more than one-fifth of an ounce of explosive composition, and seven samples of crackers were found to contain explosive ingredient other than black gunpowder.

Among these seven samples of crackers, three were found to contain aluminium, two to contain chlorate and phosphorus and one to contain chlorate. There were two Customs' cases involving 15 exhibits of crackers. These crackers were found to contain aluminium and chlorate. Thus the explosive ingredients were not only not gunpowder but also contained the prohibited ingredient chlorate.

On behalf of the Police 32 inspections of magazines for storage of explosives were made prior to renewal of licences. One magazine belonging to the Singapore Harbour Board was for storage of transit consignment of safety cartridges only. It was recommended that the amount of safety cartridges allowed to be stored should not exceed 250,000 rounds. At the time of inspection two magazines (explosive magazine and detonator magazine) were found to have explosives far in excess of the amount permitted under the licence. It was recommended that licence should not be renewed unless the amount of explosives and detonators stored did not exceed 200 lbs. and 400 rounds respectively.

Petroleum

There was a slight decrease in the number of non-dangerous petroleum for flash point tests, 1,018 as compared with 1,208 for 1960. Approximately 74 per cent was from bulk shipment.

The number of ship inspections showed a slight decrease, 780 as compared with 862 for 1960. Approximately 38 per cent of the inspections, which included re-inspections, carried out, were on ships which had carried dangerous petroleum (i.e. petroleum flashing below 73°F). Only on ten occasions was a ship certified as not being gas-free. Ships which had carried dangerous petroleum have to be statutorily gas-freed before they can proceed to dock for repairs.

Inspections of Premises

On request three inspections were carried out. One was as a result of complaint of black smutty smoke being emitted from the stack of a tyre retreading factory. There were at the premises about eleven tyre retreading moulds and it was said that six or seven moulds would be in use at one time under normal load. At the time of the inspection only two moulds were seen to have steam supplied to them and no black smoke was seen issuing from the stack. The boiler had automatic controls to regulate the supply of boiler-feed water, fuel and possibly air. Situated close to the boiler was an electric air blower with pipe arrangements to supply additional air to the boiler when needed. Smutty smoke emission occurs when there is inefficient working of the boiler due to incomplete burning of a fuel-air mixture which is over-rich owing to either an over supply to fuel or under supply of air. It is not unlikely that at the time when smutty smoke emission was seen the factory was working at full capacity and the boiler was being over-worked or overfed with fuel.

On request the air-conditioned laboratory room of the Dental School used for preparing histological specimens was visited. At the time of the visit there was a distinct odour of xylene. Although three samples of the air taken at different times were found to contain xylene in amount below the maximum allowable concentration, namely 200 parts per million, the possibility could not be ruled out that at times conditions in the room could have been more severe.

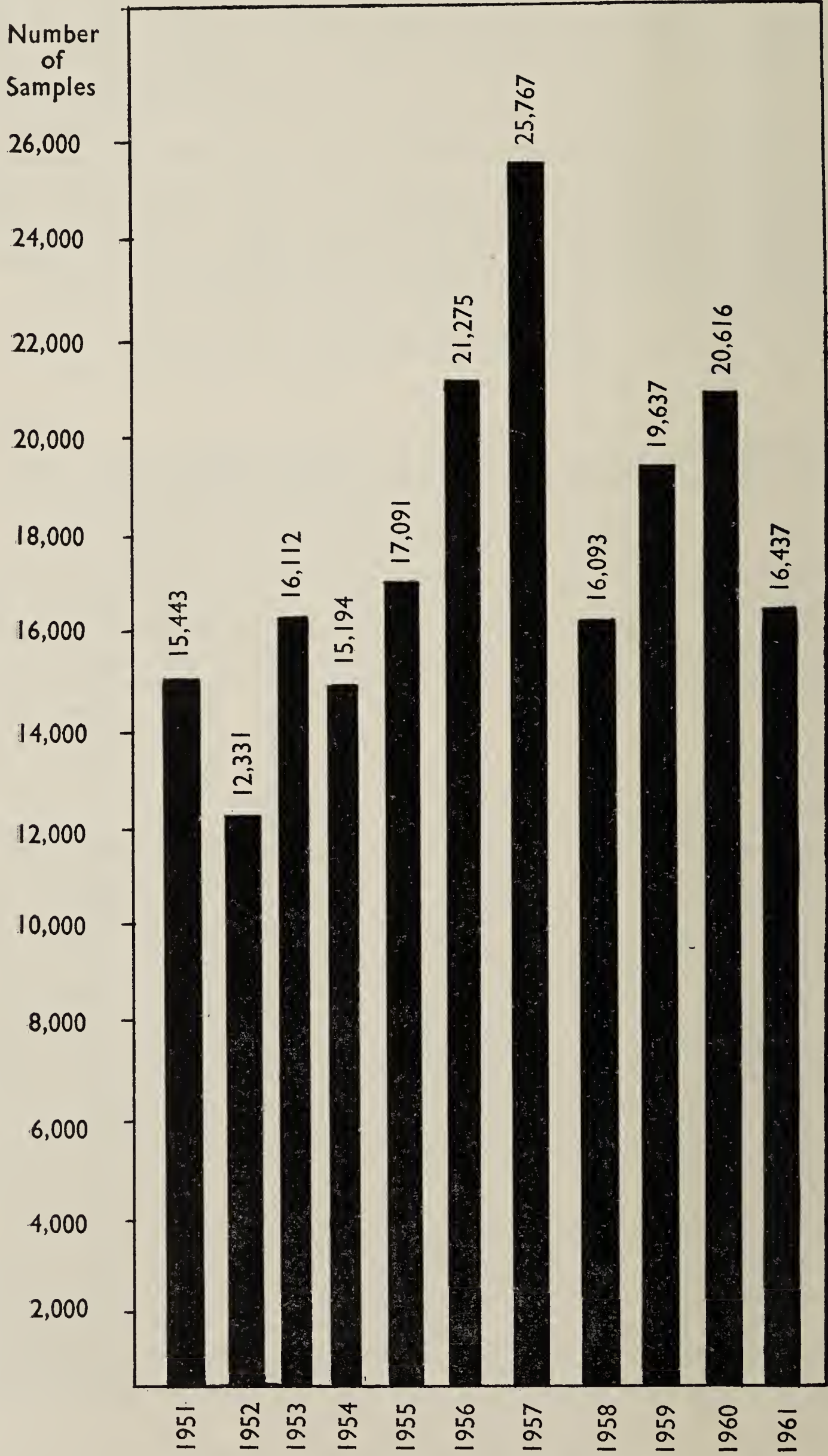
Dangerous Occurrences

The case involved a fatality in the oil tank of a ship. This tank was empty and had been out of use for approximately six months. After the lid had been taken off, a man entered the tank and collapsed. A rescuer also collapsed but was brought out alive by a second rescuer with gas mask. When the atmosphere of the tank was tested, on request, about three hours after the incident, the oxygen content was found to be normal, that is, approximately 21 per cent. The result was not unexpected as by this time the tank would have been ventilated by natural diffusion of air into it. The adjacent tank was opened and tested immediately and the atmosphere was found to contain 13 per cent of oxygen indicating a deficiency of eight per cent of oxygen.

DISTRIBUTION OF WORK 1961

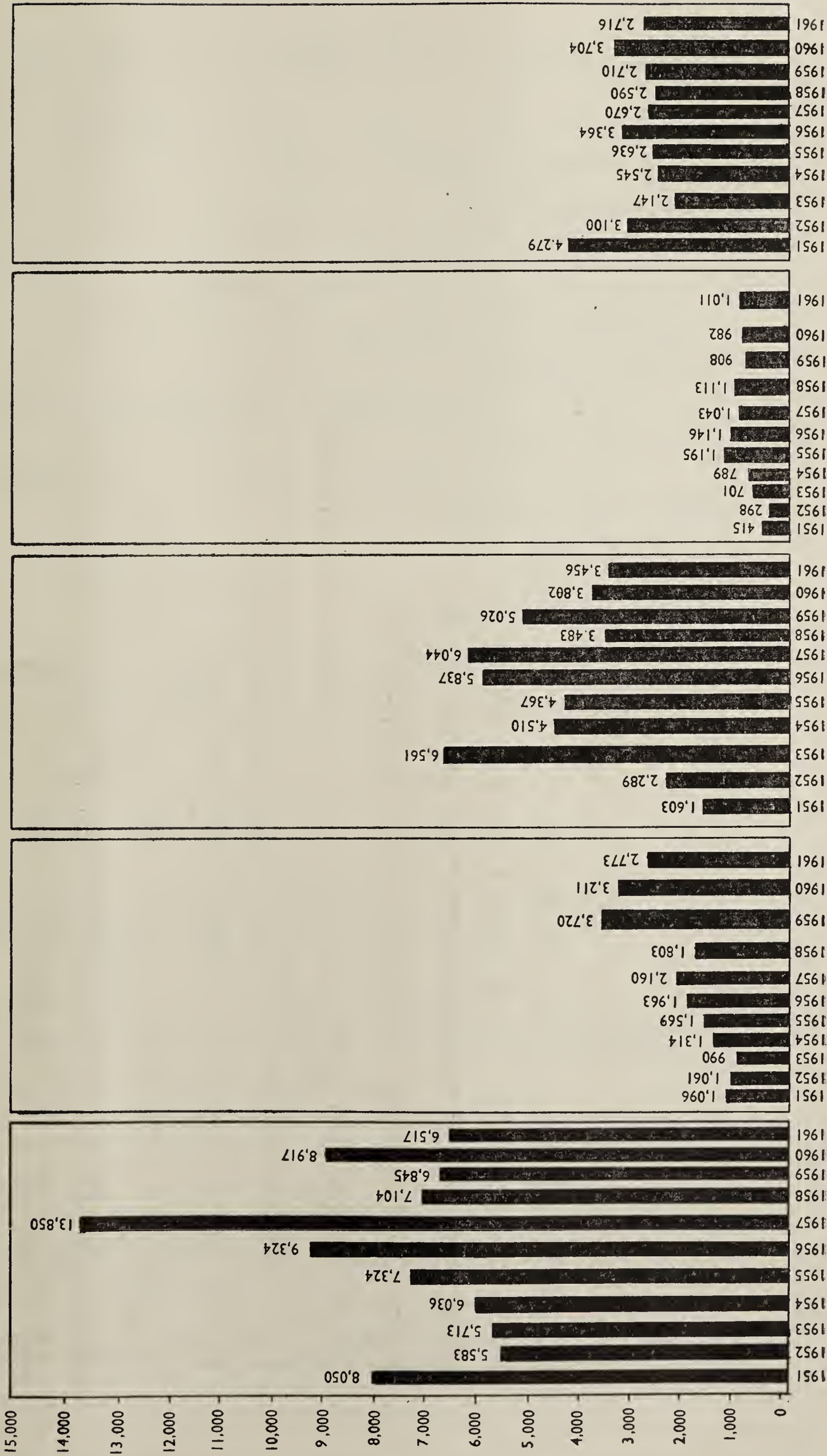
Class of Work	SOURCE						
	Customs	Medical	Police	Other Depart- ments	Non- Official	Total Samples	Total Cases
<i>Explosives:</i>							
Inspection ..	..	..	245	..	..	245	..
Industrial ..	..	..	..	..	53	53	..
Fireworks ..	15	..	86	..	..	101	..
Magazines ..	..	..	32	..	..	32	..
<i>Petroleum:</i>							
Flash-point tests ..	..	..	..	..	1,018	1,018	..
Ship inspections ..	..	..	..	..	780	780	..
<i>Premises:</i>							
Inspections ..	1	1	..	1	..	3	..
Dangerous Occurrences	..	..	2	..	..	2	1
Total ..	16	1	365	1	1,851	2,234	1

TOTAL SAMPLES ANALYSED BY THE DEPARTMENT OF CHEMISTRY
SINGAPORE, 1951-1961



NUMBER OF SAMPLES FROM VARIOUS SOURCES ANALYSED BY THE DEPARTMENT OF CHEMISTRY SINGAPORE, 1951-1961

CUSTOMS MEDICAL POLICE OTHER-DEPARTMENTS NON-OFFICIAL



APPENDIX I

STAFF LIST

Chief Chemist and Chief Inspector of Dangerous Materials: Chia Chwee Leong, B.Sc., M.Sc., F.R.I.C.

Senior Chemist and Senior Inspector of Dangerous Materials: Lim Chin Hua, B.Sc., D.I.C., A.R.I.C.

Chemist and Inspector of Dangerous Materials:

Lee Kum Tatt, B.Sc., Ph.D., A.R.I.C., M.C.I.C.

Phang Sing Eng, B.Sc., M.Sc., A.R.I.C.

Tan Jake Meng, B.Sc., Dip. Chem. Eng., A.R.I.C.

Chou Kai Chih, B.Sc., D.I.C., A.R.I.C.

Miss P. R. Williams, B.Sc., M.Sc. (resigned in March)

M. C. Dutt, B.Sc., M.Sc. A.R.I.C.

Theng Chye Yam, B.A. (Mod.), M.Sc.

Lim Han Yong, B.Sc.

Document Examiner: Ch'ng Beng Han, B.Sc. (Acting)

Assistant Inspector of Dangerous Materials: Ch'ng Beng Han, B.Sc., Ang Eng Ann, B.Sc., Aw Soon Cheong, B.Sc.

Chief Laboratory Assistant: Thng Soon Tee.

Laboratory Assistant, Special Grade: Pwee Sye Cheow, Chow Weng Seng.

Executive Officer: Ismail bin. H. M. Zain.

Laboratory Assistants: Eight.

Clerical Officers: Five.

Clerical Assistant: One.

Laboratory Attendants: Fifteen.

Watchman: One.

APPENDIX II

DISTRIBUTION OF LABORATORY WORK 1961

Sections	SOURCE						Total Cases
	Customs	Medical	Police	Other Departments	Non-Official	Total Samples	
Forensic	575	25	2,964	31	131	3,726	885
Health	388	1,045	13	385	79	1,910	23
Miscellaneous ..	92	15	3	593	68	771	..
Revenue	5,446	..	..	..	538	5,984	..
Toxicology .. ..	..	1,687	111	1	49	1,848	749
Dangerous and Hazardous Materials ..	16	1	365	1	1,851	2,234	1
Total ..	6,517	2,773	3,456	1,011	2,716	16,473	1,658

APPENDIX III

PUBLICATIONS

The Isolation and Identification of 1-Ethynylcyclohexyl Carbamate and its Metabolites from Toxicological Specimens. Lee Kum Tatt — *J. Pharm. Pharmacol.*, 1961, 13, 759-765.

A Routine Method for determining Caffeine in Coffee and Coffee Mixtures. Lee Kum Tatt — *Analyst*, 1961, 86, 825-828.

Modification of Quantitative Colorimetric Estimation of Glutethimide in Toxicology. S. E. Phang, M. C. Dutt and Thng Soon Tee, *J. Pharm. Pharmacol.* 1961, 13, 319-320.

THE CITY ANALYST'S DEPARTMENT

The volume of work undertaken by the City Analyst's Department decreased during the year when a total number of 26,127 samples were examined. The decrease in the number of samples was 15.3 per cent of the number examined in 1960. This decrease was due mainly to four factors: (i) the water shortage in Singapore, resulting in less samples sent in by the City Water Department for analysis, (ii) the three weeks' strike by the Public Daily-rated workers, which resulted only in a trickle of samples received from the various departments during the strike period, (iii) the closing down of Alexandra Sewage Purification Works, and (iv) the shortage of staff, which resulted in less work being undertaken for the Food and Drugs Section and for commercial firms. The decrease of 4,700 samples is made up as follows: 2,550 samples from City Water Department, 1,100 samples from Sewerage Department, 700 samples from City Health Department, 150 samples of swimming pool water from City Architect and Building Surveyor's Department and 200 samples from commercial firms.

The samples received for testing can be classified according to their source of origin as follows:

	Samples
Water Department	16,798
Gas Department	6
Engineer's Department —	
Sewerage Section	3,189
Engineer's Section	41
Architect and Building Surveyor's Department ...	4,034
Health Department	1,335
Administrator's Department	9
Fire Brigade	16
Commercial Firms	699
Total ...	26,127

A general indication of the nature of the samples examined and of the diverse consultative and advisory work carried out for the various departments of the Council is given below.

WATER DEPARTMENT

The following samples were analysed for the Water Department:

Routine Daily Water Samples —

	Samples
from treatment works and distribution system ...	10,243
from camp supplies	1,401
for fluorine test	4,459
Monthly samples of raw water	25
Monthly samples from clear water tanks	55
Urine for fluorine test	276
Boiler Water	191
Carried forward ...	16,650

	<i>Brought forward</i>	...	16,650
Special Investigations —			
Soil			1
Sand			4
Unknown Material			1
Plastic Cover			1
Sediment			1
Tap Water			11
Raw Water (New Sources)			9
Raw and Treated Water (Old Sources) for specific tests			13
Chemicals for Specification Tests —			
Hydrated Lime			16
Sulphate of Alumina			19
Sodium Silicate			22
Sodium Silicofluoride			4
Sodium Bicarbonate			3
Preparation of Chemical Reagents			41
Calcium Chloride			1
Sterilizing Tablets			1
			<hr/>
			16,798

The total number of samples analysed in 1961 is approximately 2,550 samples less than in 1960. This decrease in samples was due mainly to (i) the water shortage in Singapore, causing temporary closing down of Woodleigh Works (from 26th August to 26th October) and Bukit Timah Works (from 1st to 25th September and again from 2nd October to 24th November), and (ii) the three weeks' strike of the Public Daily-rated employees in November. For the first time in Singapore, water rationing was introduced from 1st September, 1961, to 25th January, 1962.

The water supply of Singapore continues to be derived partly from Johore and partly from the island itself. The sources of supply are one river, several impounding reservoirs and the underground supply in Bedok. The water undergoes full chemical treatment at five works, two in Johore and three on the island. The treatment capacity at Tebrau was increased in 1961 from 35 m.g.d. to 50 m.g.d. by the addition of 2 clarifiers and 4 filters to the previous set of 5 clarifiers and 8 filters.

The treatment used at Tebrau Works was that employing "activated silica" in conjunction with small doses of lime and alum. At the other four works at Gunong Pulai, Bukit Timah, Woodleigh and Bedok, the conventional lime-alum treatment was used.

New sources of supply looked into were the water from Jurong River, Johore River and Scudai River. In the case of Jurong River, tests were made to determine the suitability of the water for industrial use in the Jurong Industrial Project. The water from Johore and Scudai Rivers were found to be water with little pollution, which could be satisfactorily treated with either the conventional alum/lime treatment or better still with the additional use of activated silica. The treated water from both these sources were found to be of excellent quality.

With the breaking of the Monsoons which ended the drought, the City Water Department experienced considerable difficulty in flocculating the Tebrau River water, because of its variable characteristics. Investigations carried out by us showed that by increasing the amount of activated silica slightly from the normal dosage of 5 to 6 p.p.m. SiO_2 and using the normal low dosage of alum, the difficulty in flocculation could be overcome.

Fluoridation to the level of approximately 0.7 p.p.m. of fluorine carried out in the four large works continued into its fifth year. Daily results of the fluorine contents of tap water were sent to the Chief Dental Officer, Ministry of Health, who is making a survey on the benefits or otherwise of the addition of fluorine to water on the dental health of school children. The results of this survey have yet to be published. 276 samples of urine from City Water Department labourers were tested for their fluorine contents to see whether these employees were adversely affected in their health by daily handling of sodium silicofluoride powder.

One sample, comprising several pieces of a transparent, somewhat elastic, filmy material which were found floating on the water at Jalan Tebrau and Larkin University Service Reservoirs, was traced to the plastic bag used for carrying sodium silicofluoride.

GAS DEPARTMENT

Only six samples of chemical reagents were prepared for the City Gas Department.

ENGINEER'S DEPARTMENT

Sewerage Section

The following samples were analysed:

						Samples
Sewages, sludges, top-waters and effluents from sewage disposal works	...	...	...	...	...	1,664
Septic Tanks	...	...	...	...	...	1,228
River water	...	...	...	...	...	289
Soil	...	...	...	...	...	3
Reinforced Concrete	...	...	...	...	...	2
Injection Cooling Water	...	...	...	...	...	2
Water	...	...	...	...	...	1
						<hr/> 3,189 <hr/>

Routine examination of sewage samples from three sewage disposal works run by the City Council at Alexandra Road, Kim Chuan and Ulu Pandan, was carried out throughout the year. The Alexandra Road Disposal Works closed in August with the commissioning of the Ulu Pandan Sewage Purification Works. The analysis of the Ulu Pandan Works' samples was undertaken on a temporary basis, the Laboratory Officer of Ulu Pandan, was on study leave in U.K.

The average results of the effluents are given in Table D. The quality of the effluent from Kim Chuan Road Works, which uses the activated sludge process, was slightly better, compared with the quality in 1960. The average effluent at the Outfall Conduit with B.O.D. 22.0 p.p.m. and Suspended Solids 23.0 p.p.m. failed to pass the Royal Commission Standards by only a narrow margin. The effluent from Alexandra Road Works, using the outmoded method of percolating filter beds, showed slight deterioration, compared with the figures for the previous three years. The sending of samples from Alexandra was stopped in August. Analysis of samples undertaken for Ulu Pandan Sewage Purification Works showed that the effluent was poor in quality, because of the high suspended solids (94 p.p.m. at Outfall Conduit). This was due to the fact that the digestion tanks and drying beds were not ready when the works was commissioned. The sludges from the sedimentation tanks had therefore to be recirculated within the available plants, with the resultant deterioration of the effluent. The effluent will no doubt improve when the digesters and drying beds are ready.

The number of samples from private purification plants decreased by 30 per cent compared with the 1960 figure, but is still higher than the 1959 figure by 18 samples. This decrease was due mainly to the three weeks' strike when no samples were sent. The majority of the effluents from these plants were found to be unsatisfactory and not suitable for discharge. The average results of effluents from these plants were as follows:

TABLE D

	p.p.m.
Free Ammonia	22.9
Albuminoid Ammonia	3.73
Oxygen Absorbed from Permanganate in 4 hours	20.5
Suspended Solids	61.3
Chlorides (as Cl)	36.0
Nitrates (as N)	1.25

Waters from the following canals and rivers were examined: Singapore River, Geylang River, Kallang River, Serangoon River, Sungei Whampoa, Katong Canal, Siglap Canal, Stamford Canal and Rochore Canal. Results obtained showed that some of these rivers continued to deteriorate to an alarming condition, caused by heavy discharges of trade effluents. Because of this and the representation put up by this Department to control further pollution of rivers, a Committee on Trade Waste Discharge was eventually formed on 10th July, 1961. The City Analyst and the Chief Chemist are members of this Committee, which also includes representatives from the Economic Development Board, Primary Production Department, Ministry of Health, Chief Planner's Office, P.W.D., Inspectorate of Factories and the City Water Department. The main work of the Committee at present is:

- (i) to work out the standards of trade effluents which can be discharged into (a) the sewerage system, (b) water courses, (c) waste land, (d) atmosphere, and
- (ii) to advise industries on ways and means of disposal of their trade effluents.

Three samples of soil were tested for pH, two samples of reinforced concrete for compliance with British standard specifications, two samples of injection cooling water for hexavalent chromium content to determine the amount of chromate used as an anti-corrosive, and one sample of water for suitability for drinking purposes.

City Engineer's Section

Ten samples of 3 per cent NaOH solutions for soil-testing and 29 samples of blotting-paper to be used for hydrogen sulphide detection were prepared. Two samples of dried sludge were analysed to determine their suitability for use as fertilisers by the Primary Production Section of the Ministry of National Development.

ARCHITECT AND BUILDING SURVEYOR'S DEPARTMENT

The following samples were analysed:

Swimming Pool Water —	Samples
from Mount Emily Pool	550
from Yan Kit Pool	1,100
from Farrer Park Pool	1,099
from River Valley Road	1,099
Van Kleef Aquarium Water	185
Hydrated Lime	1
	<hr/> 4,034 <hr/>

The swimming pools run by the City Council remained at four for 1961. These pools are all filled with fresh water, which are tested daily. The good condition of the water in all the pools was maintained throughout the year. 185 samples of salt and fresh water from Van Kleef Aquarium were also received for examination.

HEALTH DEPARTMENT

1,335 samples were received from the Health Department. This number is 699 samples lower than the all-time high total for 1960, but is higher than the figures for 1958 and 1959. These samples were taken mainly in connection with the licensing of food factories and in the enforcement of the Sale of Food and Drugs Ordinance.

The range and variety of the samples received are given in the following list:

Food (1,131 samples) —					Samples
Milk and Milk Products	...	...	...	...	203
Beverages	...	...	...	...	367
Condiments	...	...	...	...	65
Cooking Oils and Fats	...	...	...	...	88
Canned Food	...	...	...	...	44
Fresh Fruits and Other Foods	...	...	...	...	364
Drugs (116 samples) —					
B.P. and B.P.C. drugs	...	...	...	...	49
Patent Medicines and Native Medicines				...	67
Other samples (Cosmetics, Well Water, etc.)	...	...	...	...	88
					<hr/> 1,335 <hr/>

The number of formal samples received under the Sale of Food and Drugs Ordinance was 498, of which 75 were found to be adulterated, below standard or otherwise defective, and appropriate certificates were issued for these samples. The proportion of unsatisfactory samples was 15.1 per cent. Details of the adulteration and other irregularities found are given in Table E.

The Food and Drugs (Amendment) Regulation, 1961 were passed by the Legislative Assembly on 22nd February, 1961. Among other things, these regulations amended regulation 19 on colouring matters by introducing a permitted list of colouring matters in place of a prohibited list, and also brought in a list of anti-oxidants which are permitted to be used in edible oils and fats, butter for manufacturing purposes and essential oils. Another important amendment allows the sale of dried vitaminised skimmed milk in Singapore without added colouring, provided it is packed in containers not exceeding five pounds and labelled properly.

Of interest was the discovery of the widespread use of boric acid as a preservative in Chinese sausages. In those samples quantitatively tested, the amounts of boric acid were found to range from 360 p.p.m. to 2,760 p.p.m. Boric acid is a prohibited preservative. It was also found to be used in a few samples of vermicelli (mee). Another prohibited preservative, salicylic acid, was found in canned sardines, anchovies and tuna of Italian origin.

Saccharin continued to be widely used as an artificial sweetener in several samples of aerated water, syrups, sauces and preserved fruits. Its use is governed by regulation 23 of the Food and Drugs Regulations, 1957.

Many samples of groundnut oil were found to be non-genuine. The chief adulterant found was coconut oil; other adulterants were found to be cotton-seed oil and soya-bean oil.

A large number of hair-darkeners, in the form of lotions and pomades, were found to have lead salt as an ingredient. One sample of sourma (mascara) was found to be essentially lead sulphide. Regulation 29 of the Food and Drugs Regulations prohibits the import and sale of cosmetics containing lead or its compound. One locally-produced sample of hair-dye was found to have barium peroxide, a listed poison in the Poisons Ordinance.

ADMINISTRATOR'S DEPARTMENT

Nine lots of photographic developer solution were prepared for the Administrator's Department.

FIRE BRIGADE

Nine samples of liquid were tested to see whether they were "petroleum" of "dangerous petroleum" as defined in the Petroleum Ordinance. Four samples of liquid products were analysed to determine whether they could be classified under the definition of "cellulose solution" in the Cellulose Solution By-laws or "petroleum" in the Petroleum Ordinance.

Three samples of Christmas Cracker fillings were tested to see whether they came under the classification of (a) black gunpowder or (b) fireworks.

COMMERCIAL FIRMS

A total of 699 samples were received and reported on. The samples may be classified as follows:

					Samples
Essential Oils	...	..	..	...	15
Vegetable Oils	...	...	...	...	43
Local Produce	...	...	...	...	13
Food	...	...	...	...	102
Drugs	...	...	...	...	16
Chemicals	...	...	...	...	14
Feeding Stuffs	...	...	...	...	1
Building Materials	...	...	...	...	1
Fuels and Petroleum Products	...	...	...	...	18
Swimming Pool Waters, etc.	...	...	...	...	465
Miscellaneous	...	...	...	...	11
					699

Swimming pool water and water for drinking and industrial purposes made up 67 per cent of the samples analysed for the public. The swimming pool water were from several social clubs, one seamen's club, three Royal Air Force Stations and a hotel. Requests for advice on water supply and water treatment continued to be received from Tawau and Sandakan in North Borneo, Tanjong Pinang, an island in the Rhio Archipelago, Djarkarat, several neighbouring islands of Indonesia and several towns in the Federation of Malaya.

Tests were carried out on several samples of lead cable sheeting, water and deposits to determine the causes of corrosion. Whenever possible, advice on remedial measures to overcome corrosion were given.

The full range of the samples examined for commercial firms is given in the following list:

Essential oils: patchouli.

Vegetable oils: palm, coconut, groundnut, cooking product.

Local produce: copra, copra cake, jelutong.

Food: ice cream mix, fresh milk, reconstituted milk, creamy milk, condensed milk, blackcurrant syrup, glucose syrup, "Rubosa" syrup, sugar orange, drink tablets, lemon juice, barley sugar, cane sugar, coffee drink, coffee powder, coffee mixture, cocoa powder, wheat flour, sago flour, tapioca flour, butter, ghee, flavouring essence.

Drugs: Vitamin B1 tablets, Chinese medicine, "Venus" tablets, medicated oil, cough mixture.

Chemicals: N/10 caustic potash, N/10 sodium hydroxide, carbon dioxide gas, sodium carbonate.

Feeding Stuff: groundnut cake.

Building material: Portland cement.

Fuels and petroleum products: Fuel oil, coke, transformer oil.

Swimming pool water, etc., pool water, raw water, cooling water, well water, treated water, washer water, river water, distilled water, boiler water.

Miscellaneous: lead sheath, sewage effluent, galvanised pipe, sand, deposit, colouring powder, trade effluent, soap.

STAFF

In January 1961, Mr. Lim Chin Kuan, City Analyst and Mr. Chan Woon Peng, Laboratory Assistant, resigned from the staff and Mr. Loke Fook Seng, Assistant Analyst, who had been seconded to the Pasir Panjang Power Station since 1959, was permanently transferred there with effect from 1st January, 1961. Thus in February the technical staff position was precarious, since out of five senior posts two were filled and out of nine junior posts five were filled. This situation existed till May when two laboratory assistants, Mr. Soon Eng Sam and Miss Han Kin Meng were employed.

Miss Ho Siew Gim, Temporary Assistant Analyst, and Mr. Swee Lian Choo, Temporary Laboratory Assistant employed on a day-to-day basis, had their services terminated in the later half of the year. Their posts were then filled by Mr. Teo Teng Poh and Miss Pauline Chan respectively, who both assumed duty on 9th December, 1961.

Other staff changes were Mr. Ong Ho Kok taking the place of Miss Yeow Gek Choo, Temporary Clerk, and Mr. Hamid bin Ibrahim taking the place of Mr. M. Govindasamy, Peon, who requested transfer to the City Gas Department.

Mr. Chia Hong Hoe acted in the post of City Analyst throughout the year. The City Analyst wishes to place on record his thanks to all members of the staff for their loyal support and consistent and conscientious work throughout the year, and particularly between February and May when the staff position was extremely poor.

STAFF LIST

City Analyst — Chia Hong Hoe, M.Sc., D.I.C., A.R.I.C. (Acting).

Deputy City Analyst — Vacant.

Assistant City Analyst — Chia Hong Hoe, M.Sc., D.I.C., A.R.I.C., Teo Teng Poh, B.Sc. (appointed on 9th December, 1961), Miss Ho Siew Gim, B.Sc. (contract terminated on 6th October, 1961) One vacancy.

Laboratory Officer — Vacant.

Senior Laboratory Assistant — One Beng Guan.

One vacancy.

Laboratory Assistants — Six.

Clerical Officers — Two.

Typist — One.

Store Assistant — One.

Laboratory Attendants — Eight (two vacancies).

Peon — One.

TABLE A

RAW WATER

AVERAGES OF DAILY ANALYSIS FOR THE YEAR, 1961
(Results in Parts Per Million)

	Tebrau River	Pontian Reservoir	Gunong Pulai Reservoir	Peirce Reservoir	MacRitchie Reservoir
Nitrite Nitrogen	absent	absent	absent	absent	absent
Carbon Dioxide	3.0	1.9	2.7	1.48	1.29
Total Alkalinity (as CaCO ₃) ..	3.1	5.6	6.3	2.5	2.8
pH Value	6.1	6.7	6.5	6.3	6.4
Colour (Hazen Units) ..	23.5	11.8	25.7	18.0	19.1
Iron (as Fe)	0.37	0.30	0.31	0.32	0.25

TABLE B

TREATED WATER FROM CLEAN WATER TANKS

AVERAGES OF DAILY ANALYSIS FOR THE YEAR, 1961
(Results in Parts per Million)

	Tebrau	Gunong Pulai	Woodleigh	Bukit Timah
Nitrate Nitrogen	absent	absent	absent	trace
Carbon Dioxide	0.46	0.22	0.62	0.52
Total Alkalinity (as CaCO ₃) ..	19.1	11.5	7.7	8.5
pH Value	7.7	8.2	7.3	7.6
Colour (Hazen Units) ..	5	5	5	5
Iron (as Fe)	0.10	0.11	0.11	0.10
Residual Alum (as Al)	0.36	0.53	0.41	0.44
Total Residual Chlorine	0.58	0.97	0.46	0.55

TABLE C

TREATED WATER FROM CLEAN WATER TANKS

AVERAGES OF MONTHLY COMPLETE ANALYSIS, 1961

(Results in Parts Per Million)

		Tebrau	Gunong Pulai	Woodleigh	Bukit Timah	Bedok
Ammoniacal Nitrogen ..		0.07	0.23	0.17	0.20	1.06
Albuminoid Nitrogen ..		0.03	0.05	0.04	0.04	0.08
Nitrite Nitrogen .. ..	..	absent	absent	absent	trace	strong
Nitrate Nitrogen .. ..	..	0.03	0.03	0.02	0.04	0.15
Carbon Dioxide .. ..	..	0.53	0.19	0.70	0.53	6.2
Total Alkalinity (as CaCO ₃) ..		11.7	11.6	6.2	8.7	98.3
Total Hardness (as CaCO ₃) ..		24.6	23.5	22.9	24.5	167.8
Carbonate Hardness (as CaCO ₃)		11.7	11.6	6.2	8.7	98.3
Chlorides (as Cl) .. ..	..	8.3	6.8	6.9	6.9	28.0
Iron (as Fe) .. ..	..	0.10	0.11	0.10	0.10	0.22
Soluble Alum (as Al) ..		0.35	0.52	0.27	0.51	0.11
Total Residual Chlorine ..		0.46	0.93	0.43	0.55	0.53
Oxygen Absorbed from Perman- ganate in 4 hours ..	..	0.36	0.57	0.58	0.47	0.86
B.O.D. in 3 days .. ..	..	0.22	0.14	0.19	0.23	0.17
Total Solid Residue ..		53.0	51.9	44.9	49.4	295
Suspended Solids .. ..	..	1.8	0.3	Nil	0.1	0.9
Colour (Hazen Units) ..		5	5	5	5	5
Turbidity (Silica Units) ..		1.8	1.1	1.0	1.2	1.9
pH Value .. ..	..	7.6	8.2	7.2	7.7	7.5

TABLE D
AVERAGE ANALYSIS OF SEWAGE WORKS EFFLUENTS, 1961
(In parts per million)

	ALEXANDRA ROAD WORKS*			LIM CHUAN ROAD WORKS			ULU PANDAN SEWAGE PURIFICATION WORKS†		
	A, B, E Filters	C, D Filters	Outfall Channel	Phase I	Phase II	Outfall Conduit	Final Effluent (South)	Final Effluent (North)	Outfall Conduit
Ammoniacal Nitrogen	19.6	17.1	19.7	24.6	22.1	23.6	14.3	15	..
Albuminoid Nitrogen	3.2	3.2	3.9	4.3	3.0	3.3	2.1	2.3	..
Oxygen Absorbed from KMnO ₄ in 4 hours	15.4	15.8	23.5	25.8	10.3	14.2	13.9	9.4	12.8
B.O.D. (3 days)	28.7	30.4	44.0	57.6	14.2	22.0	21.0	13.1	22.2
Total Solids	754	877	880	601	550	575	1,120	1,259	..
Suspended Solids	32	35	78	43	25	23	73	58	94
Nitrates	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	..
Chlorides	269	304	269	166	162	164	367	392	403
pH Value	7.3	7.4	7.4	7.4	7.5	7.5	7.2	7.2	7.1

*Averages for Alexandra Road Works are for period January to August.

†Averages for Ulu Pandan Sewage Purification Works are for period September to December.

TABLE E

FOOD AND DRUGS SAMPLES ADULTERATED OR OTHERWISE IRREGULAR

No.	Sample	Nature of Irregularity.
7	Milk	Deficient in solids-not fat.
3	Coffee Powder	Deficient in coffee.
2	Coffee Mixture	Deficient in coffee.
13	Soft Drinks	Contained saccharin.
3	Syrups, Squashes and Cordials	Contained saccharin.
3	Blackcurrant Syrup	Deficient in stated ascorbic acid content.
2	Rose Hip Syrup	Deficient in stated ascorbic acid content.
2	Soft Drinks	Contained excessive benzoic acid.
4	Whisky	Deficient in proof spirit.
13	Preserved Fruits	Contained saccharin.
5	Pork Sausages	Contained boric acid.
1	Tomato Catchup	Contained saccharin.
1	Jam	Contained benzoic acid.
11	Groundnut Oil	Non-genuine groundnut oil.
1	Cooking Oil	Contained 90% coconut oil.
1	Vermicelli	Contained boric acid.
1	Sourma (Mascara)	Found to be essentially lead sulphide.
1	Aspirin Tablets	Excessive acetylsalicylic acid content.
1	Multi-vitamin tablets	Deficient in Vitamin C and Vitamin B1.

Total number of samples received	...	...	498
Number of unsatisfactory samples	...	...	75
Percentage of unsatisfactory samples	...	...	15.1%

APPENDIX

FINANCIAL STATEMENT FOR THE YEAR 1961

Receipts	\$		Expenditure	\$	
		c.			c.
Licence Fees	Personal Emoluments	...	24,918,961 74
Health Branch (Quarantine and Other Charges)	Annually Recurrent Expenditure:		
Sales of Medical Stores	General	652,555 89	
Chemistry Department Fees	Health Branch (including City Health)	13,557,218 82	
City Health — Laboratory Fees for Examinations	Hospitals and Dispensaries	9,259,502 36	
City Health — Fees for Analysis	Chemistry Department	46,682 09	23,515,959 16
Fees for Removal of Nightsoil, Refuse, etc.	Special Expenditure:		
Rents	General	162,562 57	
Hospitals Bills	Health Branch (including City Health)	218,019 85	
Slaughtering Fees	Hospitals and Dispensaries	150,707 43	
Refund of Capital Grant from S.A.T.A.	Chemistry Department	1,414 55	532,704 40
Reimbursement of Electricity and Water Charges	Development and Capital Expenditure	...	743,997 20
Miscellaneous Receipts			
Balance borne by Public Revenue			
					<u>49,711,622 50</u>



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